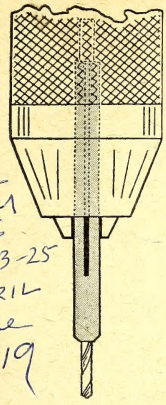

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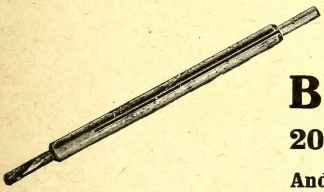
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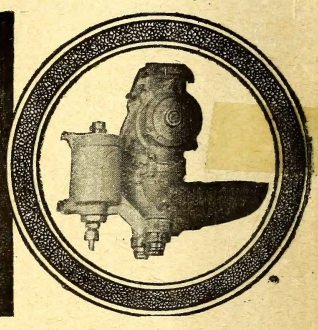
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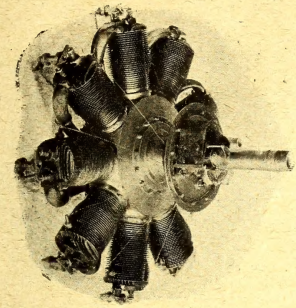
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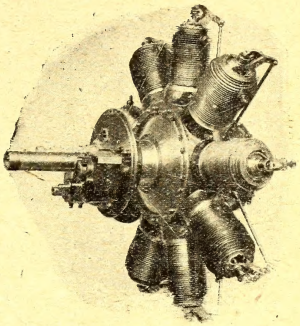
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ON THE SELECTION OF AVIATORS.

In these sheets a week ago there appeared a lengthy report of a paper read by Dr. L. T. Stamm, late R.A.F., in which the lecturer pointed out to the Institute of Actuaries that Lloyd's Underwriters who intend to take up the insurance of aviators, aircraft, and aerial passengers should pay particular attention to the physical fitness of the pilots of all kinds of aircraft. He advocated that the insurance people should arrange for their own doctors to inspect pilots at intervals, and he discoursed most interestingly on the various ills to which the flesh—and the brain, when any—of the pilot is heir.

Though in the lecture he was primarily concerned with the health of the pilot as it affects civil aviation, Dr. Stamm included Service pilots in his discussion presumably because they also concern insurance companies by reason of their own life assurances. Therefore one feels justified in quoting Dr. Stamm in support of the argument that in re-making the Royal Air Force, and especially in the matter of giving the first two thousand promised permanent commissions, in the R.A.F. the very greatest attention should be paid to the health of the personnel, both physical and mental.

Though there are few more fallacious proverbs than that which says "*Mens sana in corpore sano*"—for some of the sanest minds are in the veriest crocks of bodies, and some of the healthiest bodies are purely animal and have no minds at all—it is of the greatest importance that in the re-made R.A.F., and among civilian aviators also, the pilots in particular should be sound in mind and body.

As one has said on previous occasions, the fact that a man has been a first-class war pilot is in no way a guarantee that he will be of any use as an R.A.F. officer in time of peace or as a pilot or manager of commercial aircraft Other things being equal, the active-service aviator should always have preference over anybody else. But distinction as a war-pilot should not be allowed by itself to entitle a man either to a permanent commission or to a job.

A Libel Story.

Being oneself concerned in a libel action during the next day or two may give point to the following story which not only adorns a tale but points a moral to what succeeds it. The story goes that a certain provincial paper wished to refer in a complimentary manner to a gentleman of the type which Lord Hugh Cecil recently described as a "disinterred example of military eminence." Unfortunately, owing to a misprint, the paper called him a "bottle-scarred veteran."

Somewhat naturally the epithet produced a severe letter from the officer's solicitors, who demanded an ample and prompt apology. This the paper published in all sincerity, but the festive compositor made another horrible error, with the result that the apology ended by saying, "of course we *should* have described this officer as a battle-scared veteran."

The story does not relate what happened next, but one imagines that the immediate effect must have been the death of the officer owing to apoplexy.

The Undesirables.

Be that as it may, there you have, and very aptly described, the two types of officers who should on no account be given permanent commissions in the R.A.F. The former in particular should not be given a job in civil aviation either.

The "bottle-scarred veteran" is an incurable. His state of mind, or rather of appetite, is excellently illustrated in a story which has recently come into circulation :—

Two long-service soldiers were demobilised and drew quite handsome gratuities. They clubbed their gratuities together and bought a public-house, where in due course they entered into possession.

Five minutes after the legal time of opening on their first day there was a violent hammering on the door. One of the partners went to the door and found there a regular customer of the house, who demanded to know how much longer they were going to be about opening the place. "Gawd!" replied the Tommy, in amazement. "We ain't goin' to *open* this pub.! We've *bought* it!"

When a man has reached the stage of being a chronic drunkard he should be turned out of aviation, no matter what his ability may be. There are, as is well known to any R.A.F. officer or man, certain pilots who will never fly unless they have doped themselves first with alcohol. There are others who, though they will fly when cold sober, fly better—for the time being—when they are drunk. There are others who have the sense not to drink when they are going to fly, but who soak steadily in the mess or at home afterwards.

There are some who are as drunk as possible as far as possible all day long, but who have a curious faculty of sobering up, and becoming quite steady as far as appearances go, when they are getting ready to fly. And there are others who stagger to their machines, climb into them in a dazed kind of way, and yet fly beautifully when once they are off the ground. Yet others have the habit of taking a drink or two before they start and of taking a flask—which later in their career becomes a bottle—of liquor (generally brandy) with them, so that they can have a nip now and again while in the air.

None of them would ever admit that they drink to keep their nerve going. They merely say that it makes them feel happier about things in general and gives the world a rosier colour. One has oneself heard a young

officer announce to the world at large in a restaurant, "I'm never happy unless I'm half tight."

Now, in a decent infantry regiment of the Old Army men of such habits would very soon find that they had better resign their commissions, and there is still more reason why they should not be allowed to remain in the R.A.F. They are a constant danger to all who fly with them as passengers and to all who are on the ground below them, for sooner or later the "bottle-scarred veteran" will be let down by his overstrained and stimulated nerves and will come to a sticky end.

What Every Doctor Knows.

Every R.A.F. doctor knows the truth of all that one has stated hereinbefore, and that knowledge is probably at the back of Dr. Stamm's warning to the Insurance people that "In the case of alcohol one has also to reckon with the possibility of more sudden and disastrous effects" than in the case of too much smoking. He said further, "It is an open question whether a small amount of stimulant with meals is not actually beneficial, at any rate to some people. It is the habit of promiscuous 'drinks,' be they few or many, that has such baneful effects, both immediate and remote."

It is true that Lieut.-Colonel Flack, another R.A.F. doctor, disagreed to the extent of denying that the best pilots are teetotalers, and said that in selecting pilots, other things being equal, the fact that a man was a teetotaler "would go against him," and one agrees with him that "those who never take alcohol are not such good sportsmen." But one feels sure that Colonel Flack would be the first to turn down a pilot who showed signs of hard drinking, or one who was known not to be able to carry his liquor like a gentleman.

On the West Coast of Africa it is a recognised fact that in the bad areas the hard drinkers die first, the teetotalers next, and that the moderate drinkers stand the climate best. It is much the same with flying nerve.

The teetotaler is always a crank, but there is little fear of his nerve going just because he does not drink. All the same, a little alcohol now and again might just give his system the stimulus necessary to improve his health in quite other respects, and so might save him from getting into a run-down state which would ultimately affect his nerves.

But so far as aviation of all kinds is concerned the "bottle-scarred" veteran must be cleared out. One's only wonder is that the R.A.F. authorities have for so long continued the pay of so many pilots and other officers who are notoriously confirmed drunkards.

One does not for a moment suggest that they are the majority of the pilots. They are in fact a small minority. But they are an infectious lot, and injurious to the moral of the Service. They lure youngsters into drunken habits. They are a nuisance in the mess and in their clubs. They are conducive to indiscipline in that they earn and deserve the contempt of the men under them. And they are a constant danger to the public on the ground.

Anyone in the R.A.F. could probably rattle off the names of half a dozen of them among his own circle, without stopping to think, and in the total they must run into some hundreds. So the sooner they are cleared out of the Service the better.

The Battle-Scared Veteran.

But the merely "battle-scared veteran" may make quite a good civilian aviator. One has in mind a particularly brilliant pilot who frankly admitted that he was scared to death of battle-flying, but who continued to do very valuable work for the nation after he was sent back from the front.—Here one desires to assure all ex-R.A.F. or present R.A.F. pilots, and all the civilian pilots, that one has not one of *them* in mind. People are so apt to jump to conclusions in these days.

Also, certain of one's personal friends who are perfectly priceless pilots to whose care one would not hesitate for a moment to commit oneself confess that they have quite lost their nerve for anything in the way of fancy flying, and yet one would rather trust them than any of the young and vigorous "stunt" pilots simply because when they are in the air they take no chances and are always on the look-out for safe landing places. Such men are much less likely to crash a machine-load of paying passengers than are pilots who do not know the meaning of the word "nerves."

Pilots of their kind are likely to be very valuable to aerial transport firms. They might even be useful squadron officers in the R.A.F. because of their experience. They would at any rate do much to stop the silly stunting over beaches, promenades, roads, and so forth, which has done so much to earn for the R.A.F. in the past the reputation of being a collection of undisciplined cads.

Another Air Hog.

How little good is done by brigade or area orders is shown by the following extract from a letter:—

"I had the most horrible fright of my life the other day, when we were skating. My husband and I had taken A—— and her three little schoolfellows skating (we were the only people on a private pond), and some hateful creature in the air must have caught sight of us, for he came down and did exactly what is depicted in an advertisement for a certain school of flying in The Aeroplane.

"The four kiddies did exactly what the Huns in the picture do—the three little sisters made a rush for me, and A——, who was in the middle of the pond, represented the prostrate figure. She said afterwards that she would rather be rolled out flat than have her head knocked off. D—— and I don't come into the picture—he was in some reeds hunting for a hockey ball, and I was on the bank with one boot off tightening up a skate screw.

"I was much too indignant and scared to take the number of the aeroplane; but it was a horribly dangerous and unkind thing to come and frighten the kiddies like that. I can't imagine what any man would want to do it for. And the observer actually added insult to injury by waving his hand to us as they flew away. I think I'm 'outs' with the R.A.F. just now!"

That was written some few weeks ago by a gentlewoman who has long been keenly interested in flying, and whose house in Wiltshire has on several occasions had its internal economy deranged by the hospitality which she has lavished on errant aviators who had made forced landings in the neighbourhood.

It is difficult—indeed it is impossible—to understand the type of mind which finds pleasure in diving at vehicles on roads, or at children playing on the beach or on the ice. Even the most brainless of pilots must have enough approximately human intelligence to know that his act can only frighten those below him, and that they cannot feel the slightest admiration for what he himself doubtless regards as his skill in "flirting with death"—one believes that such is the correct journalistic *cliché*.

Therefore his only possible motive in such a performance must be that peculiarly contemptible form of vanity which consists in self-admiration, and may be expressed concisely in the phrase, "What a hell of a fellow I am!"

When one sees one of these air-hogs at work one's only sentiment is that of regret that he escapes time after time without crashing and injuring himself for life. One never wishes for his instantaneous death in a crash following one of his stunts, because that would be far too easy a let-off for a swine of his species, whose only mission in life seems to be that of proving that pigs can fly.

The Air Ministry's Opportunity.

Be that as it may, it is earnestly to be hoped that in selecting aviators for permanent commissions and for civilian flying those who have to make the selection will be careful to wash out those who are known to be addicted to air-hoggery.

It has been announced officially that there were at the signing of the Armistice 30,000 officers in the R.A.F. It has also been announced that there are to be 11,000 officers in the R.A.F. for the Army of Occupation—which includes the "Army of the Rhine" as it is officially called, and all units at home, and elsewhere. It is said that 2,000 permanent commissions are to be given in the immediate future, and that the peace-time establishment of the R.A.F. will include 6,000 commissioned officers.

The arrangement seems excellent. The Personnel Department at the Air Ministry has a great opportunity. It can choose its first 2,000 from the very pick of the R.A.F. Only the very finest characters who have proved themselves to be first-class leaders of men, administrators, and fighters all at once should be included in that 2,000.

The remaining 4,000 can then be selected at leisure from the 11,000 of the R.A.F. with the Army of Occupation. That Army—and its accompanying Air Force—must exist until Germany has discharged all her obligations under the expected Peace Treaty, and until Austria, Hungary, Bulgaria, and Turkey have done likewise and have settled down to normal peaceful conditions. That will mean several years to come.

People are rather apt to think that the Anglo-German-Belgian-Dutch army which won the battle of Waterloo packed up and went home one day in June, 1815. As a matter of history there was an Army of Occupation—consisting of English, German, Prussian, Russian, Austrian, and assorted Hun soldiery—in France until late in 1819. So we may expect to see a Franco-British Army in Germany until some time in 1922 or 1923.

Besides which, if our Government has any sense at all, we shall raise a goodly volunteer Army, with a disproportionately large Air Force, for the invasion of Russia and the smashing of Bolshevik power this year. That war might well keep going for another five years or more, reckoning on the analogy of the wars following the French Revolution of 1789.—But of that one will discourse at a later date.

The Chosen People of the R.A.F.

The point is that for the time being some 9,000 R.A.F. officers—namely the 11,000 of the Air Force of Occupation, minus the 2,000 permanent commissions—will be on probation for the remaining 4,000 permanent commissions. That happy state of affairs should enable the Personnel Department of the Air Ministry to produce at the end of the probationary period the finest armed force which has ever worn the King's uniform. It will be a lamentable failure on the part of the Master-General of Personnel if such a result does not follow.

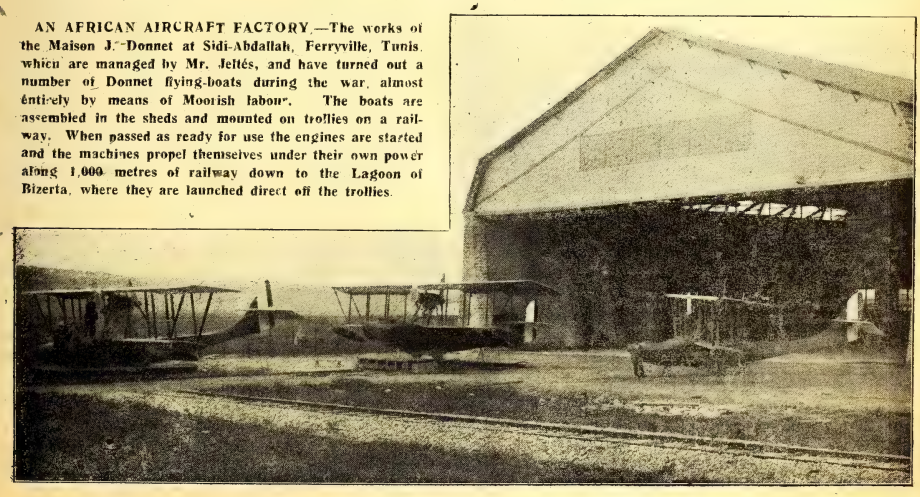
The 11,000 are at present still on probation, for one has not heard as yet of any permanent commissions being signed by the King. The first 2,000 should be absolutely flawless examples of the *preux chevalier* of the air, *sans peur et sans reproche*. Such a number can surely be found.

The rest of the 11,000 will, one hopes, endeavour to model their behaviour on that of the chosen 2,000 and not on that of the baby-scarers and invalid-killers who have brought reproach and contempt on the R.A.F. uniform.

The Patient Point of View.

Some few weeks ago one dealt with much this same theme and published a letter describing the manners and customs of the wrong sort of officer. The writer quoted the instance of an Officer Commanding a training station who on occasion was so drunk that he lay under the table in blissful ignorance of the fact that the mere uncommissioned Cadets whom he was supposed to be training to be officers and gentlemen were squirting him with soda-water. This produced a letter in reply which is worth quoting. It reads thus:—

> Sir,—I have just read with disgust the letter—apparently written by an officer of the Force—in your issue of The Aeroplane of 5th ult. May I take the liberty of suggesting that the publication of a letter of this description is, to say the least, carrying things a bit too far?
>
> Here we have, to use your own words, "a letter written in a passion," yet you published it as, as far as I can see, an absolute proof of a great many of your recent criticisms of the Air Force officer.
>
> I am inclined to think that the modicum of truth in this letter might be likened to "telling tales out of school," and, moreover, the writing of it shows an absolute lack of that *esprit de corps* which we all, you with us, wish to make "absolute."
>
> Perhaps this "lack" is why the writer is in (apparently) no great favour with the authorities.
>
> In quite a different strain is "Soldier's" letter of this week's issue, and perhaps you will agree, Sir, that therein may be found ample explanation of the same unfortunate occurrences of which you and your correspondent appear to make so much.
>
> Believe me, Sir, the "core" of the Royal Air Force is good



AN AFRICAN AIRCRAFT FACTORY.—The works of the Maison J. Donnet at Sidi-Abdallah, Ferryville, Tunis, which are managed by Mr. Jeltés, and have turned out a number of Donnet flying-boats during the war, almost entirely by means of Moorish labour. The boats are assembled in the sheds and mounted on trollies on a railway. When passed as ready for use the engines are started and the machines propel themselves under their own power along 1,000 metres of railway down to the Lagoon of Bizerta, where they are launched direct off the trollies.

and solid, and will, I am sure, preserve the "fruit" that is around it.

Do not forget that in times such as we have just passed through it is impossible to keep the "cockle out of the wheat." But given time—to continue my simile—the cockle can be tied in bundles to burn.

Your criticisms, Sir, are often good and appreciated by your many readers, but the constant dragging of other people's dirty washing—and very little at that—into public seems to me and my brother-officers a form of occupation unproductive and unprofitable to all concerned.

(Signed) R.F.C. ex R.N.

THE JUSTIFICATION OF THE PUBLIC LAUNDRY.

Naturally one sympathises with the writer, who was formerly a Naval officer, but one does not agree with him. Surely it is better that dirty linen should be washed in public than that it should not be washed at all. At any rate, it is then exposed to the fresh air and is ultimately cleansed, though it may give offence at the time. And that is preferable to leaving it in an unsavoury mass in a confined state where it becomes a danger to the health of its own household.

To adopt the writer's own metaphor, a sound core alone would not preserve a fruit which is affected externally with disease. And unfortunately it is the external disease of the R.A.F. which is so evident to everybody. Therefore it is necessary to spray the still immature fruit with a strong germicide, so that it may develop to its full health and strength. It is true that the spraying process does attract attention to the disease, but it is better in the end for the resultant crop.

In the early days of the war there were Regular Officers of the finest type who resented one's efforts to provide the R.F.C. with better aeroplanes and engines. They would rather have been killed in a B.E. than have flown safely over Hunland in a superior "Trade" machine which was given to them as the result of public agitation. Similarly, no doubt, there are officers who would rather wait for years for the R.A.F. to "find itself" than have it cleaned out and remade as the result of public exposure of its evils.

But, this is the most critical period in the existence of the R.A.F. The opportunity offers itself to build up the finest Service in the world with the least possible trouble and without being unfair to people who think that they have claims to permanent commissions because they are hard fighters and hard workers in spite of being hard drinkers and hard livers. Now is the time to find the men who happen to be officers and gentlemen as well as hard fighters and workers, and to get rid of those who, despite their warlike virtues, would not be a credit to the Flying Services.

Therefore, one claims that one is justified in giving the fullest publicity to such evils as affect the R.A.F. to-day, and must be driven out from the R.A.F. of the future. For if those evils are exposed now, the authorities can have no excuse in the future for selecting men of the wrong type for permanent commissions.

A REASON IN WRITING.

Nobody in the R.A.F. can be more desirous of seeing our Flying Services the finest in the world than one is oneself. One knew every individual officer of the R.N.A.S. and the R.F.C. when they were first formed, and one's chief desire is to see the new Flying Services—whether they are to be combined in the R.A.F. or split, as they should be, among the three Services—raised again to the level of Service spirit, intelligence, smartness, and loyalty of the original units from which they have grown.

And one's next desire is to see that those who engage in commercial aeronautics shall carry with them into civil aviation the Service spirit of devotion to duty, keenness for efficiency, self respect, and due regard for law order and decency, by which alone civilian flying can be made a success, can avoid being regarded as a circus stunt or as being on the level of a country fair, and can attain to its proper position as the equal of the British Mercantile Marine, that unofficial Service which has the proudest and finest record of any of our national efforts during the War.

It is one's jealousy for the good name of British aeronautics, both Service and Civilian, which obliges one to expose the defects in our aerial constitution in the hopes of curing them much as fresh air cures gangrene, instead of allowing them to fester in obscurity till they become a danger to aeronautical progress.—C. G. G.

THE HENDON HANDLEY PAGE SCANDAL.

Apropos a recent paragraph in this paper inquiring why some twenty Handley Page machines have been pegged out in the wet at Hendon for several weeks—and in some cases for months—one is moved to ask further questions.

Is it a fact that when the difficulty of housing the large output of Handley Pages became acute the Kite Balloon Department of the Air Ministry notified the Equipment Department that there were in its possession something over a hundred portable sheds for kite-balloons, each of which sheds would be capable of housing a Handley Page when the wings are folded?

Is it a fact that such sheds are or were available?

If so, why were they not used?

If such sheds exist, is it a fact that they are at present lying in store, folded up and suffering from the effects of damp and rats?

If the facts are as implied in these questions, is anybody to be made responsible for the waste of public money involved?

When one recalls all the fuss which was made over the loss of a few hundreds of thousands of pounds at Loch Doon, it seems strange that such a scandalous state of affairs as that involved in the waste of these Handley Pages, which represent almost as much money as the Loch Doon affair, should be passed without notice. The Loch Doon affair was at worst an error of judgment. This seems to be either a case of gross neglect of duty or of sheer imbecility. In either event the person who is responsible deserves to be severely punished.

C. G. G.

THE ROYAL AERO CLUB, 1919.

The Royal Aero Club held its annual general meeting on March 31st. The following members were elected to fill the nine vacancies on the committee:—

Dunville, Lieut.-Col. John D., R.A.F.
Grey, Lieut.-Col. Spenser D. A., D.S.O., R.A.F.
Holden, Brig.-Gen. Sir Capel, K.C.B., F.R.S.
Hubbard, Lieut.-Col. T. O'B., R.A.F.
McClean, Lieut.-Col. F. K.
Maitland, Brig.-Gen. E. M., D.S.O., R.A.F.
Northcliffe, Lord.
Ogilvie, Lieut.-Col. Alec, R.A.F.
Page, F. Handley.

The full committee for 1919 is therefore as follows:—

Chairman: Brig.-Gen. the Duke of Atholl, K.T., M.V.O., D.S.O.
Brancker, Maj.-Gen. Sir W. S., K.C.B.
Bucknall, Ernest C.
Cockburn, G. B.
Dunville, Lieut.-Col. John D.,
Grey, Lieut.-Col. Spenser D. A., D.S.O.
Holden, Brig.-Gen. Sir Capel, K.C.B., F.R.S.
Hubbard, Lieut.-Col. T. O'B., M.C.
Lloyd, Col. F. Lindsay, C.M.G.
McClean, Lieut.-Col. F. K.,
Maitland, Brig.-Gen. E. M., D.S.O.
Moore-Brabazon, Lieut.-Col. J. T. C., M.P.
Northcliffe, The Rt. Hon. the Viscount.
Ogilvie, Lieut.-Col. Alec,
Page, F. Handley.
Samson, Col. C. R., D.S.O.
Singer, A. Mortimer.
Sopwith, T. O. M.

One hopes that the revised committee will act better and more promptly in the interests of all members of the Royal Aero Club than have committees of the past.

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WHAT DOES IT MEAN?

The two advertisements which appear below were published in the Agony Column of recent issues of the "Times" newspaper. It has been suggested that they have to do with the R.A.F., and a solution of the puzzle would be interesting :—

T.G.N.—Return at once. Ca's departed. R. M. too dashing. Two vacant places.

T.G.N.—M. G. P. Dangerously ill and must go for sea voyage.—C.

The letters T.G.N. are doubtless intended merely to catch the eye of an individual, but the other letters do undoubtedly fit certain officers of the R.A.F. For example, C.A.S. (which is probably arranged as "Ca's" merely as camouflage) stands for Chief of the Air Staff. As is commonly known, General Trenchard has been dangerously ill, and there are, unfortunately, those who hope that he may not return to duty at the Bolo House. So in this case the wish may be father to the thought.

R.M. form the initials of Brig.-General R. M. Groves, whose activity and intense desire for efficiency may very well cause him to be considered "too dashing" by those who prefer inefficiency and a policy of drift. Thus there are probably some who hope to see "two vacant places."

M.G.P. is the common abbreviation for the Master-General of Personnel, an office now held by Admiral Lambert, formerly Fourth Sea Lord of the Admiralty. Or they might be a purposeful inversion of the initials of Major-General Sir Godfrey Marshall Paine, now Inspector-General R.A.F. and formerly M.G.P. One has not heard of the illness of either of these officers, and one hopes that they are in the best of health, but possibly the advertiser is better informed.

If anyone in this country wished to communicate quickly with somebody in the "Army of the Rhine" it seems quite possible that the Agony Column of the "Times" would be swifter and surer than a letter, besides being safer—for letters do sometimes fall into the wrong hands. Therefore one is tempted to ask whether this is a part of a fresh series of Bolo intrigues. Any light on the subject will be welcomed.—C. G. G.

GERMAN NAVAL AIRCRAFT.

The following account of the visit of the Allied Naval Commission to German Seaplane Stations is abstracted from an article by a member of the Commission which was published by the "Times":—

German light cruisers, battle cruisers, and battleships showed no evidence either of carrying aeroplanes or of having been equipped to carry and fly them. The very evident astonishment which the Germans displayed at the sight of aeroplanes perched on the turrets of British battleships and battle cruisers, or on the revolving platforms of the light cruisers, made it practically certain that they were gazing on a sight entirely new to them. Even greater was the excitement they displayed at the sight of the British "carrier" ships.

When the squadron of "Kaisers" were being escorted up to Scapa for internment, the "Argus," which was out in the Firth "doing trials," passed the German line, on opposite courses, at a distance of not over 1,200 yards. The monstrous loom of her fantastically high freeboard, the unbroken run of the deck which was almost as large as a polo field, the smoke welling up from under her stern, the aeroplane diving for a landing, combined to form an apparition which seemed fairly to carry the Germans on all five of the ships off their feet with excitement.

The low sandy coasts of Germany on both the North Sea and the Baltic lend themselves admirably to seaplane stations, and those established have been placed and improved with the greatest skill and care.

The principal stations inspected by parties from the Allied Naval Commission were Wilhelmshaven, Nordeney, Borkum, Heligoland, and Sylt, on the North Sea side, and Kiel, Warnemünde, and two stations on the island of Rugen, in the Baltic. Of these, Nordeney, undoubtedly one of the largest and best-equipped seaplane stations in the world, and Warnemünde, the principal German experimental station for naval heavier-than-air machines, were the most interesting.

The general run of machines at Nordeney were of tried and proven types, such as the Frederichshafen, Brandenburg, and Albatros, with which the Allies were already thoroughly familiar. The one exception was a giant monoplane flying-boat, which is undoubtedly the most striking machine of that character in existence at present. Its wing-spread of perhaps 130 ft. is exceeded by that of a number of Allied and German machines, but a chord of wing of between 15 ft. and 20 ft. had hardly been equalled, at least in any of the types known to the public.

The hull of the boat was largely of steel and duralium, and looked stiff enough to weather very heavy seas. Roughly speaking, it looked to be from three to four times the displacement of that of the earlier types of Curtiss flying-boats, and incomparably more comfortable. Between the wings was a stoutly-built house for a pilot, containing a sound-proof room for the wireless operator.

According to a German officer, this giant monoplane flying-boat was the last gift of the great Count Zeppelin to the German people. He completed the design of it before he died, but most of the construction and all the experimental development of it have been carried out since.

Because Count Zeppelin, at the time he designed this machine, did not believe it possible, on account of its great size and weight, to land safely on the earth, he decided to make it of the flying-boat type. It was to be kept at a seaplane station on the coast of Belgium, to fly over the front on bombing raids. He chose the monoplane type on account of the trouble always found from the lower plane of a biplane being knocked about by the waves in a rough sea.

Before the "Giant" was used for bombing experiments it had been proved possible to land large aeroplanes safely on the earth. As that made it possible for bombing raids to start nearer their objectives than if they had been pinned down to coastal stations, the Zeppelin flying-boat was turned over to the Naval Air Service for long-distance reconnaissance. For this work it was proving highly satisfactory, although it had to be flown—and especially to be landed—very carefully.

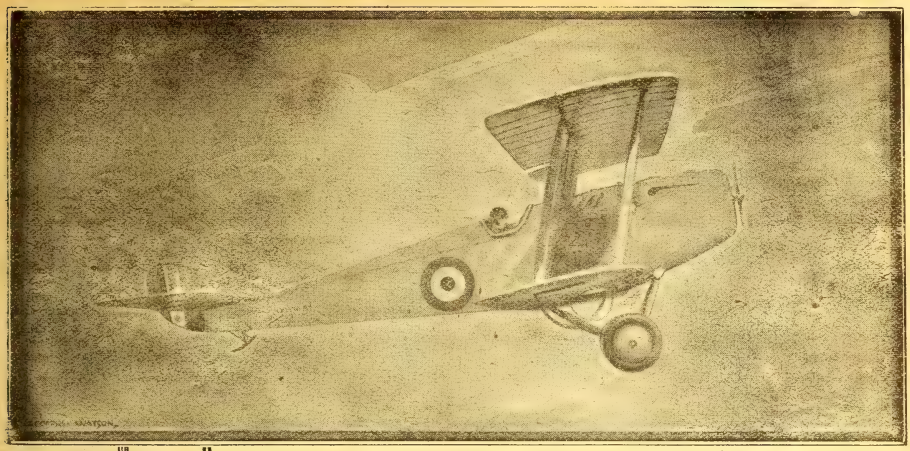
The German naval authorities had not counted on their great experiment station at Warnemünde being included among those which the Allied Naval Commission should inspect, and it was only after the most vehement protests that they finally acceded to Admiral Browning's demand that facilities for such a visit should be arranged. Warnemünde is a prosperous port and summer resort on the south coast of the Baltic about 100 miles east of Kiel.

There were close on 200 machines in the dozen or more sheds, practically all of them new types, or old ones in process of improvement. The latter included some very useful-looking Brandenburgs, Albatroses, Frederichshafens, and Gothas, most of which seemed to indicate an effort toward lightness and speed rather than an increase in size. Light but very strong steel pontoons were the rule among all of these new machines. Generally speaking, they were less highly finished than similar British and French types, but there was no indication whatever that they had suffered through shortage of any materials. Aluminium—or, where greater strength was an object, the alloy, duralium—were used lavishly, and even brass and nickel were not skimped. The camouflaging had been very cheaply and effectively done by printing a design—usually a hexagonal pattern, in which deep maroons and indigos predominated—directly upon the fabric before applying the dope. This could hardly have represented five per cent. of the labour of painting the "dazzle" designs separately; yet—on the score of decreasing visability at least—it is undoubtedly the more effective of the two methods.

A two-engined Gotha torpedo-carrying seaplane attracted a good deal of interest, less on its own account than because it was expected that the Germans would have given much attention to the development of this type. It was never felt, right down to the day of the Armistice, that the Grand Fleet was absolutely safe in either Scapa or Rosyth from an attack by torpedo-carrying seaplanes—brought over in a carrier-ship, of course. Yet it now appears that the Germans had done much less in developing this branch of their flying service than the Allies.

Of very late types there were several each of Travemundes, S.V.K.S., and Sablatnigs, none of them large, but all showing the constant effort to develop more speed. Especially interesting were two or three of the new all-metal Junkers, even the wings of which were made of corrugated sheets of duralium.

Warnemünde's most spectacular exhibit was a "giant" seaplane with four engines and a wing-spread of something like 150 feet. Though this was greater than that of the great monoplane at Nordeney, it is not improbable that the latter had a greater wing area and perhaps a greater lifting power. Perhaps I can give no better idea of the size of the fuselage of this seaplane than by mentioning that, in the course of the inspection, four of the Allied officers and twelve of the Germans were inside it at the same time, and that, standing on the floor, I could catch no glimpse of one of them.





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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

H.R.H. the Prince of Wales at the Handley Page Aeroplane Factory.

H.R.H. the Prince of Wales visited the Handley Page factory at Cricklewood, on Thursday, March 27th, accompanied by H.R.H. Prince Albert. The Princes made an inspection of the works that lasted two hours.

A Change of Title.

The King has been pleased to approve the alteration of the title "Secretary of State for the Royal Air Force" to that of "Secretary of State for Air."

Two Rumours Denied.

It is stated in the "Times" that the following two rumours have no foundation whatever:—

"Firstly, that Mr. Winston Churchill, Secretary of State for War, was contemplating breaking up the Royal Air Force and restoring its Military and Naval branches to the separate control of the War Office and the Admiralty.

"Secondly, the rumour which concerned the Department of Civilian Aviation, and credited Sir Eric Geddes with the design of absorbing this Department under the supreme control of the Transport Ministry."

We shall next hear doubts cast on the rumour to the effect that lighter-than-air ships are to be controlled by the local Inspectors of Weights and Measures

43 Squadron's Dinner.

43 Squadron R.F.C. and R.A.F. propose to hold a Dinner in London. Will members present and past write to Lieut. H. C. Hull, Red Lion Hotel, Salisbury?

Sixty-Year-Old Pilots.

The remark made by Maj.-Gen. Sir W. S. Brancker, K.C.B., A.F.C., at the meeting at the Institute of Actuaries, reported in last week's issue, to the effect that a pilot is not necessarily too old at 60, has aroused some interest. It is well that the general public should understand that the pilot of a commercial machine need not be a youthful acrobat. The aerial liners of the future may, in many cases, be piloted by staid, experienced officers of a type similar to the Captains of crack Atlantic seacraft. Youth will not have everything its own way in peace-time aviation; there will be room for experience, though Major-General Brancker must not be understood to mean that "none but the old deserve the air."

Octogenarian Anxious to Fly.

When an application for permission to hold a flying fair came before the Peterborough Town Council recently, Alderman Daniel Redhead, who has just turned 82, said he is anxious to fly. "We shall all be expected to fly soon," he said, "so the sooner we see how it's done the better." Alderman Redhead has not lost courage with age.

Flying as a Sport.

This season flying as a sport is to be a big feature of the Ranelagh Club's programme. Several aeroplanes for the use of the members will be maintained at the Club.

The machines will be of two types—Vickers passenger aeroplanes, with a seating accommodation for 10 passengers, and Vickers two-seaters. The "Times" states that members will be allowed to use these machines for trips to the Continent or to any part of England, or merely for short trips round the London district. Members will be able also to learn flying at the Club. It is interesting to note that some of the very first flights by Mr. Grahame-White, Mr. G. Hamel, and the Hon. Charles Rolls were made at Ranelagh, but one has grave doubts about the suitability of Ranelagh as an aerodrome for big passenger machines.

Aeroplanes without Pilots.

Discussing the possibilities of directing pilotless aeroplanes at a distance, the "Journal" remarks that experiments are being made in France, and that a French machine has succeeded on a prescribed route, with certain specified detours, in accomplishing a flight of 180 kilometres (about 112 miles) and in landing when so ordered in an aerodrome indicated. It would have been easy for the machine, the newspaper adds, to drop bombs anywhere at a word of command.

But does our respected contemporary really mean "at a word of command"? Even a Serjeant-Major with laminated steel lungs could not be expected to order a pilotless aeroplane to hear the order "Shun! Drop bombs," at a distance of 112 miles

A Flight to India.

An undated message from Lahore states:—The Handley-Page aeroplane, "Old Carthusian," has reached Lahore, the final stage of its journey. The pilot received many congratulations on the successful completion of the flight of over 7,000 miles.

Mrs. Hewlett going to New Zealand.

Mrs. Hewlett, who was the first British woman to fly, is going to New Zealand, and probably Australia, partly for business and partly for pleasure. Mrs. Hewlett is the wife of the well-known novelist, Mr. Maurice Hewlett. She has the distinction of being the only mother who has taught her own son to fly.

Guarding Railways with Aeroplanes.

It is reported from Cairo that during the recent disturbances aeroplanes on several occasions drove off with machine-gun fire parties of natives who were tampering with the railway lines. In police work of this description there will always be use for aeroplanes in some part of the world. One aeroplane would be more effective than many hundreds of armed guards.

The Three Essentials.

Colonel the Master of Sempill, of the Technical Department, lecturing before the Junior Institution of Engineers, said that many types of aeroplane had a future, but only the running of commercial services could test their real possibilities.

He described his flight with General Weir from Farnborough, Kent, to Mudros, Greece, a distance of 2,100 miles, where they were obliged to end their journey owing to radiator damage. Their experience showed that three things were essential: a careful consideration of the parts, good weather reports at all aerodromes, and quicker arrangements for taking in petrol.

Desertion by Aeroplane.

Desertions by aeroplanes across the Swiss frontier are again becoming frequent. According to the "Daily Express.":—

Two Italian aviators named Bizzolato and Stacko landed near Lugano in a powerful Caproni. They were in uniform, and declared openly that they had deserted. They carried two bicycles in their aeroplane. The machine is guarded by Swiss soldiers, but the occupants were liberated, as owing to the cessation of the war the authorities do not know what to do with aerial deserters.

Two Austrian officer deserters landed near Davos in an aeroplane recently.

A Heath Robinson Story.

For the following story one has to thank a lady reader of THE AEROPLANE:—

At an Exhibition of Aircraft in the North, the officer acting as the official guide, when coming to a certain machine, which shall be nameless, but of which it is sufficient to say that it was the product of the late Royal Aircraft Factory in 1916, was accustomed to say: "And here you have the type of aeroplane on which Captain Leefe Robinson brought down the first Zeppelin over England."

Later on he was succeeded by a zealous, but junior, officer, who quickly mastered most, but not all, of his senior's "patter." This is what he was overheard to say: "And here you have the aeroplane on which the famous Captain Heath Robinson brought down the first Zeppelin over England."

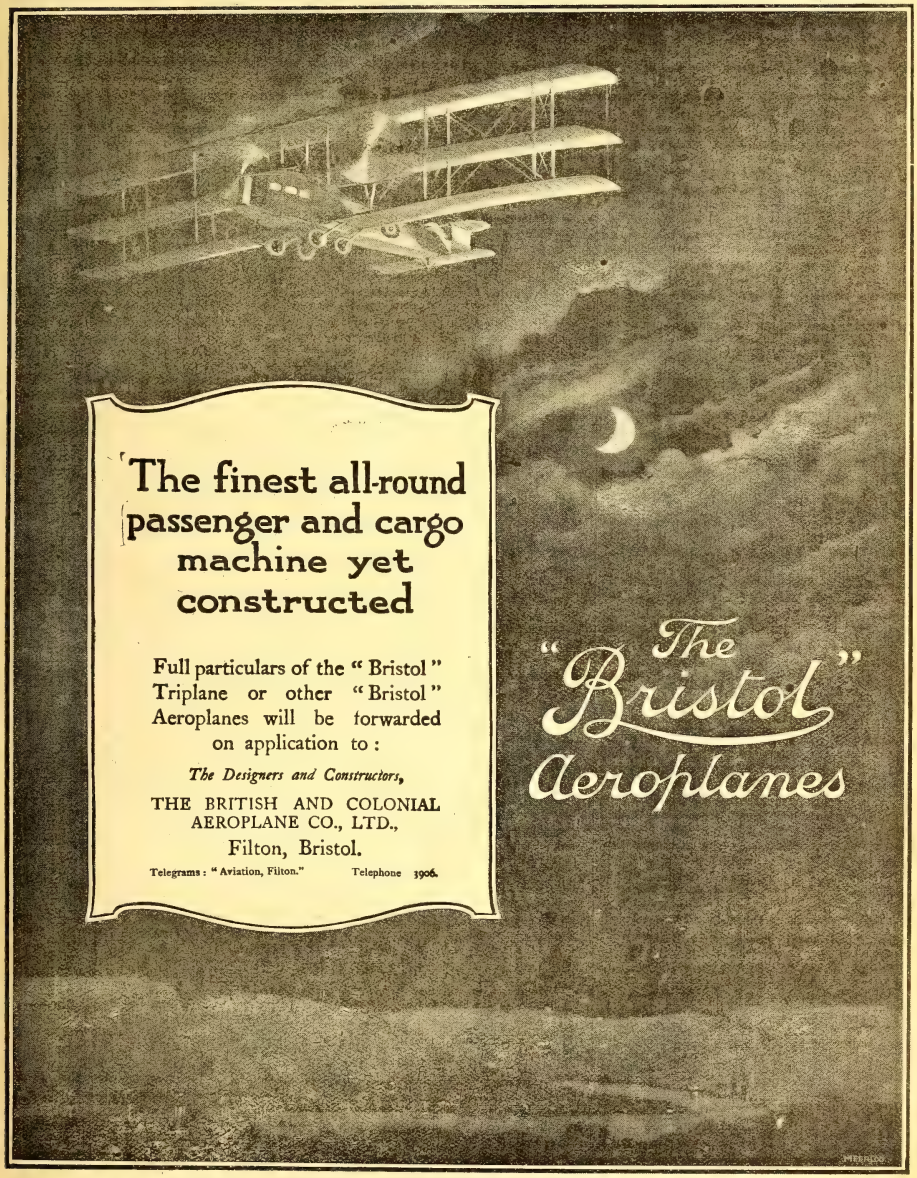
The full humour of it will be appreciated by those who know and have suffered in the machine described. And, it may be added, by those who know the kind of aeroplane Mr. Heath Robinson draws.

Managing a Ranch from an Aeroplane.

Mr. J. Pierpont-Morgan, son of the famous financier, is reported to have bought an aeroplane for the manager of his large ranch in Montana. The ranch extends over 150 miles of territory, and it has proved impracticable to build roads over which the manager can travel in a motor-car.

Mr. Schmitt, the pilot who has been engaged, was recently discharged from the American Air Service, says the "Daily Mail." He is also a wireless operator, and the aeroplane will be fitted with wireless and stations will be established at intervals on the ranch so that the manager, while making his rounds, can keep in constant touch with every part of the territory under his supervision. In this way, Mr. Morgan contends, much time and expense will be saved.

It is to be hoped that this method of supervision may be followed in other parts of the world. Owners of large farms in Australia will find aeroplanes equally useful. Little Boy (ex-Bolo) Blue would soon find those "sheep in the meadows and cows in the corn."


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Telegrams: "Aviation, Filton." Telephone 1906.
"The Bristol" Aeroplanes

The WORLD of AERONAUTICS (continued)

The London-Madrid Air Service.

Captain Hamilton, whose mission it is to inspect the ground near Vittoria with a view to the institution of an air service between London, Vittoria, and Madrid, arrived at Vittoria on March 29th.

Free Aerial Accident Insurance.

On Tuesday last, April 1st, the "Daily Mail's" new scheme of free insurance for passengers in aeroplanes and airships came into force. This journal now undertakes to pay £250 to the legal personal representative of any registered reader between the ages of 16 and 65 who is killed by an accident to any aeroplane or airship in which he or she is a fare-paying passenger. The insurance covers flights over the United Kingdom, the English and Irish Channels, the North Sea and the Continent of Europe.

This is a very sporting offer. While much discussion on aerial risks is still taking place, the publishers evidently have found that such low rates of insurance are possible that they can afford to give free policies to their readers.

America Claims the Altitude Records.

The altitude record of 28,900 feet made last September in Dayton by Major R. W. Schroeder, in an American aeroplane with a Hispano-Suiza engine, still holds, according to a cablegram received at the Aeronautical Exposition, and published officially from Washington, U.S.A.

The information, which is said to have been received from London, was to the effect that the flight which Capt. Lang, of the Royal Air Force, made on Jan. 2nd, in England, was between 27,000 feet and 28,000 feet, instead of 30,500, as reported at the time. This correction was made on a re-reading and calibration of the instruments.

The End of an Exhibition.

The Aircraft Exhibition held on Newcastle Town Moor, and which was organised by the Royal Air Force, was closed on Tuesday, April 1st, after having been open for six weeks. The success is all the more noteworthy because of the uncertain weather experienced at this time of the year.

The Exhibition, the first of its kind in the country, was originally intended to remain open for a month, but the period was extended owing to the widespread public interest in it. 175,000 people visited the Exhibition, and the payments for admission amounted to £6,400. The proceeds, after meeting expenses, are to be devoted to Royal Air Force charities.

An exceedingly satisfactory result.

Aeronautics as Part of College Courses.

The Division of Military Aeronautics, U.S.A., in co-operation with the Committee on Education and Special Training of the General Staff, has arranged a training programme for College students, which will not interfere with their prescribed College courses, but which will, at the end of three years, turn out men prepared for commercial or for military aviation.

In view of the depreciation among Reserve Officers of not less than 10 per cent. a year, it is estimated that the Air Service must draw from some source about 1,000 pilots, 650 aeroplane and balloon observers, and 100 engineer officers every year.

The Dis-Use of Parachutes.

The "Daily Mail" of March 31st published the following leading article:—

By an amazing decision attributed to the Treasury the further equipping of R.A.F. aeroplanes with parachutes has been stopped. This is economy gone hopelessly mad. The battle-efficacy of the parachute was dramatically demonstrated last year when two Boche airmen alighted in safety by this means from a giant aeroplane that was shot down in flames near Cambrai. We had a few aeroplanes equipped when hostilities ceased. If we had been more alert many valuable lives might have been saved.

It seems incredible that for the sake of a Treasury saving our airmen should be cut off from the chance of escaping from a disabled machine in mid-air. There are many unavoidable risks they must take. Why add one that is avoidable? If ships are required to carry boats and life-belts for saving life at sea, why should aeroplanes be destitute of life-saving appliances in an element less explored and quite as dangerous? For the present we prefer to believe in the existence of a misunderstanding. Whatever the explanation, Treasury parsimony must not be indulged at the expense of our airmen's lives.

Aircraft and Aviators for the Argentine.

It appears that quite a number of British aviators who are leaving the Royal Air Force have recently offered their services as Military Pilots to the Argentine Military Authorities. Some of them, it appears, have approached the Argentine Legation on the subject, and have gone so far as to state definitely to the Legation Authorities that the Argentine Government requires them.

For the benefit of aviators who may be similarly inclined one makes the announcement, which is based on an official statement by the Argentine Authorities, that no instructions have been received in this country to engage aviators for the Argentine Army, and that, moreover, it is impossible for anybody who has not been born in the Argentine to enter that nation's Army.

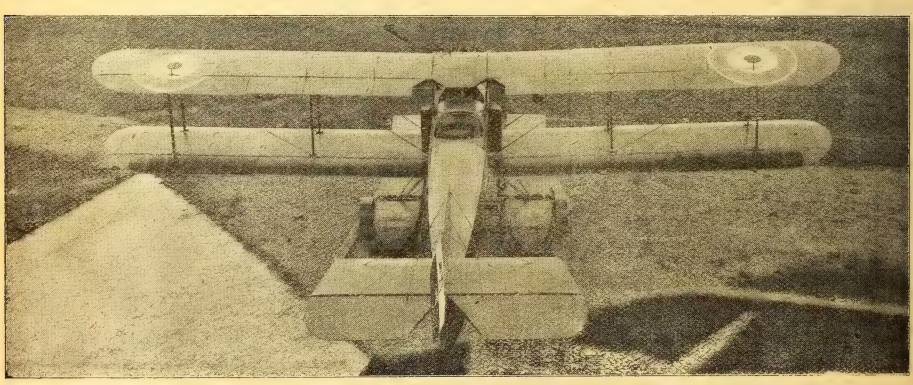
One assumes that this regulation would not be strictly enforced by the Argentine Republic if it was at war, but it certainly holds good in time of peace.

On the other hand, the Argentine Authorities are very keenly interested in British aeronautical developments, especially in relation to military aircraft, and British manufacturers who are at liberty to supply aircraft of war to foreign countries would do well to make their products known to the Argentine Military Authorities. Such photographs, specifications and so forth as are permitted by the Air Ministry to be transmitted to foreign Governments should be sent to Lieut.-Colonel Luis Jorge Garcia, Military Attaché, the Argentine Legation, 3, Holland Park Mansions, Holland Park Gardens, W.

To Canadian Aviators.

Canadians of all ranks in the R.A.F. who are interested in co-operation for military, commercial, and social purposes on their return to Canada are invited to write to "Canfly," c/o The Aeroplane, 166, Piccadilly, W.1, giving their names and addresses.

It should be noted that this has nothing to do with any employment agency, nor is it concerned with any register of pilots. It is merely an effort on the part of a Canadian officer, who is returning to Canada, to keep Canadian aviators in touch with developments and with one another.



Rear View of Fairey III.c. (360 h.p. "Eagle" Rolls-Royce), more or less of the type which has been entered for the Atlantic Flight.

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Particulars can also be obtained from any Lloyd's Broker.

The WORLD of AERONAUTICS

Another London-Paris Record.

On March 28th one of the De Havilland machines of the official communication squadron used by the Peace Conference Delegates made the flight from London to Paris, a distance of 250 miles, in one hour 20 minutes.

The Fatal Accident near Sleaford.

The following report is taken from the "Morning Post," of March 29th :—

The inquest was resumed at Cranwell Aerodrome yesterday on Captain Robin G. Dunn and Second Lieutenant William John Pegg, who were killed on the high road near Sleaford by a passing aeroplane on the 18th inst. The two officers, who were staying at Caythorp Court, used as a convalescent hospital, were driven by a groom to the meet of the Duke of Rutland's hounds, and followed along the roads.

Labraham, the groom, said they were returning when they saw an aeroplane following them. It swerved to the right and passed over the fields. Further along the road an aeroplane, which he believed to be the same, suddenly appeared from behind a rick flying very low, and came straight towards them, passing directly over the trap. He was hit on the side of the head, his hat being smashed, and this saved him. The next thing he remembered was that he was in the trap and both officers were sitting beside him dead. There was no aeroplane in sight and no one about.

Wing-Adjutant Captain C. S. Richardson said that when he heard what had happened he sent for every pilot who had been up After cautioning Lieutenant Trevor Walter Chater, he said to him : "I understand that you deliberately dived on the back of the cart on the road running along the south side of the aerodrome?" He replied, "Yes." Witness then said : "You have read and understood the rules of the aerodrome regarding low flying?" and got the answer, "Yes." The witness also saw Lieutenant Christopher Moody, who was a passenger with Lieutenant Chater at the time. When the witness questioned him, Moody said when in the air they made a dive which threw him about so much in the fuselage that when Chater made a second dive he crouched in the cockpit for security. He felt a slight bump, which he thought might be due to contact with the road.

Lieutenant Moody, in evidence, said he had been up with Chater before, and there was nothing unusual in his management of the machine that afternoon.

Mr. Charles Mellor, barrister, stated that, relying on his advice, Lieutenant Chater would not give evidence. He pointed out that the cause might be an error of judgment or a miscalculation, but the jury had heard nothing to convince them that what had happened was due to an act of gross negligence on Lieutenant Chater's part. He pointed out that Chater was only 18½ years of age, and had done only about four months' flying. He appealed to the jury to say that the youth had not been guilty of manslaughter, and expressed the deep regret of Lieutenant Chater at the fatality.

The Coroner said they could see for themselves the deep feeling with which Lieutenant Chater had watched these proceedings.

After a long consideration, the Foreman of the jury announced : "We have come to the conclusion that the two officers were accidentally killed."

[It will be necessary at a later date to make further reference to this accident. The matter is possibly sub judice at the moment and no comment can properly be made.—Ed.]

A Club for American Active-Service Aviators.

News has been received from the United States that a club has been formed by some 500 American aviators who crossed the German lines during the war. The headquarters are in New York City, at No. 11, East 38th Street. It is intended to affiliate it with the Army and Navy Air Service Association and co-operate in every way.

Laurence La Tourrette Driggs, who is said to have been a guest of the British Government and observed many of the air activities, is one of the founders of the club. He has returned to America and taken back with him a large number of valuable air trophies which are exhibited at the Aeronautical Exposition.

The price of the collection is a pennant streamer from Baron von Richthofen's Flying Circus. Mr. Driggs got it the day after the armistice was signed in one of the cities evacuated by the Germans.

Next to this in interest are the insignias from the American Air Service squadrons.

The first squadron over the German lines was the 185th Aero Squadron. This is represented by a devil holding a bomb, representing the bombardment forces. This squadron received the largest number of decorations during the war for individual work.

The Revival of "La Conquete de l'Air."

Congratulations are due to M. Adhémar de la Hault, who has revived the Aeronautical Journal "La Conquete de l'Air," published in Brussels. In the issue that has just been received there appears an article upon Aerial Navigation between England and India.

Aircraft Paintings.

Those readers of THE AEROPLANE who are sometimes in the neighbourhood of Bond Street should pay a visit to the Brook Street Art Gallery, 14, Brook Street, New Bond Street, W.1, where they will always find on view interesting speciments of water-colour drawings of aircraft by Mr. Geoffrey Watson.

The Gallery has recently been appointed sole agents for Mr. Watson's pictures, and it may be of interest to one-time active-service pilots and observers to know that Mr. Watson is willing to paint any type of machine, allied or enemy.

Colonial Flight Cadets.

The following letter from "A Colonial Flight Cadet" discloses a state of affairs that appears to need investigation :—

May I be permitted, through the medium of your paper, to lay a few facts before the public?

I have often read suggestions by you that flight cadets, instead of being demobilised against their will, should be allowed to continue their training until graduated. I consider this an excellent suggestion, and I think it applies still more to Colonial flight cadets.

As you are aware, flying ceased at the Training Squadrons about two months ago, and since that time Colonial flight cadets have been doing nothing whatever while awaiting repatriation. With the present available means of transport, it may be a few months yet before we can get home, which time could be more profitably employed in flying, and this would, I think, do much to bring about universal commercial aviation.

Apart from that consideration, I think it only fair to let the public know exactly how Colonial flight cadets are being treated prior to repatriation. The majority of South African cadets (as everyone in the Force knows) were granted commissions after leaving the Armament School, prior to joining a training station. This was due largely to the backing up of one of their Generals, and was hardly fair to the other Colonials; however, the Air Ministry is apparently going to rectify matters (*vide* General Seely's speech), by granting all Colonial cadets commissions as from Feb. 12th.

This sounds very well, and rather gives the impression that the Government is treating Colonial cadets splendidly. I am afraid, though, that it is apt to be misleading. The War Office, though making no noise about it, have already gazetted their Colonial cadets, and treat them very well at their camp at Pirbright. They have no fault to find. Although the Air Force commissions are supposed to date before the Army ones, no Colonial Air Force cadet has yet been gazetted, though the announcement came out three weeks ago! And in the meantime cadets are leaving for home!! Deeds are what we want not fine speeches.

Cadets in the Air Force who are awaiting repatriation may be divided into two classes :—Canadians at Shoreditch and all other Colonials at Blandford. The Canadians, I believe, are not badly off. I can only speak for Blandford. Blandford, as everyone knows, is a desolate enough place, but the treatment we receive there makes it ten times worse.

The mess! It is far and away the worst I have ever been to during the whole period of my training as a cadet. The cadets and flight cadets have to clean and wash up the plates, dishes and their own forks, knives and spoons, which must be taken away with them, and occasionally scrub out the dining room. All my Service-kit has been handed in at the Squadron before leaving, and one must admit that "joy rags" are hardly the clothes to wear when engaged on work of that nature!

At a training squadron flight cadets are the peers of the Officers' Mess, why should it be so different at a Repatriation Camp? The treatment we receive makes us rather regret ever having joined the Air Force (or rather, the Royal Flying Corps, as it was then). Apparently, it would have been better not to have made good, and to have been made a Serjeant-pilot rather than a flight cadet.

At any rate, we would have received better treatment, at least, at Blandford. Englishmen are certainly going the wrong way about to strengthen the bond between the Colonies and the Home Country. At Blandford nothing can be heard but discontent and dissatisfaction.

Surely, this is not as it should be; it cannot be so very hard to improve matters and make everything run smoothly and with general satisfaction. Why not give Colonials a good impression of England, and let them return home satisfied at least that they have had a square deal?

Hoping that you will see your way to publish the above.

A COLONIAL FLIGHT CADET.

PARIS NOTES

Aviation has had its red-letter days in the near and distant past, but surely it has never had such a red-letter week as the one just ended.

On Saturday, March 22nd, M. Farman's "Goliath" left Toussus-le-Noble, near Paris, on its first civilian passenger service flight between the French and Belgian capitals. The start was to have been at 9 a.m., but was delayed owing to the snow. The machine eventually left the aerodrome at 1.25 o'clock, piloted by Lt. Bossoutrot.

The burgomaster of Enghien (Belgium) was among the passengers, and on the return journey M. Rafaël Guariglia, Italian Chargé d'Affaires at Brussels, was carried. The return journey was made on Sunday, the 23rd. The respective times were:—Outward, 2 hrs. 50 min.; return, 2 hrs. 57 min., the machine landing at Toussus at 5.45 p.m. The service will be weekly until further notice.

In a spirit of *joie de vivre*—or maybe it was *joie de vol*—M. H. Farman took Lt. Nungesser for a spin in the "Berline" limousine, and a Mr. Sharp and a Capt. Clark left by air to keep a luncheon appointment at Tours!

A thumbnail sketch of the hero of the "Goliath" flights is sure to interest, so here goes:

Lt. Lucien Bossoutrot is 29 years of age. As he was in one of the first classes to be mobilised, the 2nd of August found him a corporal in the 28th Regiment of Infantry. By October 28th, 1914, he had been promoted to adjudant, and took part in the battles of Charleroi, Marne, and Reims.

Transferred to aviation in January, 1915, he obtained his brevet April 1st, No. 1,856, and his military brevet May 1st, No. 909. He was sent for duty with Squadron 22 on June 1st, and promoted to sous lieutenant in April, 1916.

He accomplished the usual squadron work, and followed his squadron from Artois (1915) to Verdun, thence to the Somme, and subsequently took part in the French offensive in Champagne in 1917. He passed unscathed through the usual incidents of war, and gained the Croix de Guerre and three citations for his 500 hours of flying. Next he was engaged on receiving machines from the Farman works at Toussus le Noble, tuning up the first F.50 and F.60 between whiles. The F.60 of 1918 is the "Goliath" of 1919.

The Paris-Bordeaux Mail.

The long-promised aerial mail, Paris-Bordeaux, was also accomplished on Saturday, the 22nd, with relays at Chateauroux. The service is being maintained in both directions. On Saturday two machines left the aerogare at le Bourget, and were "relayed" by two machines of Squadron 226 at Chateauroux. One of these latter, carrying the mail, arrived at the aerogare Beau-Desert, near Bordeaux, at 2.50. The total time was 4 hrs. 50 mins.

The second machine, having a forced descent owing to want of petrol, ran into some vines and overturned. The pilot and passenger were taken to hospital, but are not seriously hurt. The inverse journey was made by Adjudant Vachot in 3 hrs. 40 mins. (left Beau-Desert at 12.30 and arrived at le Bourget at 16.10).

Journey Divided into Two Stages.

On Sunday the mail was carried by air from Bordeaux to Paris, but not from Paris to Bordeaux. Squadron 56 is responsible for the first stage—*i.e.*, to Chateauroux—and Squadron 226 from there to Bordeaux. According to schedule, the total journey should only take 4 hours, but machines of this type having only enough fuel for 3 hours, the route is divided into two, but it will not be a permanent arrangement.

It was owing to bad weather necessitating a longer voyage that the above-mentioned accident occurred, Lt. Alary having run out of petrol. Emergency tanks are now being fitted.

On Monday the journey from Bordeaux to Paris was accomplished in 3 hrs. 40 mins. by Lt. Chretien and Lt. Gibot on a Salmson postal avion. A stop of 5 mins. was made at Chateauroux.

The Farman Frères are also starting a civilian passenger service to Bordeaux and back. An F.50, piloted by Lt. Constantin, will be used. There is seating accommodation for six passengers.

230 Kilometres an Hour.

I now come to the third and most sensational flight which it is my duty to record. I refer to that of Lt. Roget (hero, on 26/1/19, of the double crossing of the Mediterranean) on a Bréguet biplane from Marseilles to Paris in 3¾ hrs. He left Marseilles with his mechanic Offray at 10.45 on the 23rd (Sunday) and landed at Villacoublay at 2 o'clock. He thus attained an *average* speed of 230 kms. an hour! In fact, he covered the distance from Marseilles to Lyons in 1 hr. 45 mins. The ordinary express train service takes 14 hrs. from Paris to Marseilles.

The machine was fitted with a 300-h.p. Renault, and all went well—his rev. counter showed 1,500 r.p.m.—until Dijon. After that—well, his map went overboard at 1,500 metres, which height he maintained during the whole voyage. It may help one to appreciate what a fine performance this is when I say that, taking Paris as the centre of a circle, and flying for an equal distance in any direction, he could have reached in 3¾ hrs. any of the following towns—Liverpool, Bremen, Hanover, Nuremberg, Munich, Milan, Marseilles, or Bayonne. Is that not a convincing argument for the extensive trial of aerial mail carriers?

From Lille to Paris in One Hour.

Records displace each other like chicks in an incubator. The latest is that of Adjudant Patin, who with four bags of mail and 1,200 telegrams left the aerogare at Lille on the 25th at 12.15 and landed at le Bourget at 1.15, thus reducing the Paris-Lille journey to 1 hr. The official scheduled time for machines is 1½ hrs.

Under the command of Lt. Jacothet, the following aviators ensure the daily service between Paris-Lille and Paris-Brussels:—Sous-Lt. Laffon, Adjts. Rocheville, Poilleux, Monin, Serjts. Coudere, Heritier, Corne, Louis, Cpl. Maurice Farman and Patin. Cpl. Farman is the nephew of the famous constructor.

The first trial of the combined train and air mail service took place on the 23rd ult. between Nice and Avignon. A Bréguet 300-h.p., piloted by Adjt. Issert, and with a passenger, picked the mails up from the Paris express at Avignon. The machine arrived at the Californie aerodrome at Nice at 12.15. Motor vans were waiting, and the mail was at once transferred to the Central Post Office and thereafter distributed.

Un Circuit Aérien.

It is now definitely decided that the Circuit de France Aérien will take place in August. All pilots, constructors, and officials of the Aero Club having approved this period, the tour will be organised by the "Avenir," a daily journal here.

The Paris-St. Nazaire aerial mail functions regularly. Adjt. Mohr made a record when he flew Paris-Le Mans and return (400 kils.) in 2 hrs. 35 mins. Apropos the Lille-Paris in 1 hr., this does not seem so extraordinary in view of the later news that Adjt. Larmande of Squadron 472 flew from Brussels-Paris with an American officer, carrying diplomatic correspondence, in 1 hr. 25 mins.

The first military postal machine from Casablanca arrived at Tangier at 11 o'clock on March 19th. The journey took 5 hrs. A regular service is in operation between Tangier and Rabat.

Aerial Reconnaissance of the Sahara.

Some weeks ago General Nivelle sent an aerial reconnaissance mission into the middle of the Sahara in order to determine the possibility of linking up the outposts and to create a supply base for future trans-Saharien development. This was accomplished by Capt. Dandy and Lt. Andoin-Dubreuil, of 547 Algerine Squadron. Since then, however, the authorities have commenced to convert a large waste into an aerodrome 11 miles out of Tangier on the way to Fez. The semi-military aerial police will be stationed there, as also, it is expected, the aerial post.

It is probable that, when Roget or Fontan, or, mayhap, if we are lucky, both together, start on their Paris-Dakar raid, they will have a competitor in the name of Lt. Lemaitre. At any rate, he has announced his intention of trying it in two stages, the first at Casablanca and the second at Tarfaya, in the Canary Islands.

Lt. Janquet and two passengers flying from Alicante *via* Barcelona to Toulouse accomplished the 900 kilos. in 5 hrs.

A New French Hydravion.

The first trials of a new French hydravion called the "Orion" are now taking place at the Lorient Maritime Arsenal by M. Le Borghe. The following are the salient dimensions:—Span, 32 metres; length, 16 m. 50; height, 6 m. 50; chord, 3 m. 80 (at wing tips), 4 m. 50. Power unit: 3 motors, 12 cylinders, each 400 h.p., actuating 3 airscrews, 2 pushers and 1 tractor; estimated speed, 125 kms.p.h.; length of flight, 10 hrs. There is accommodation for 30 passengers in the hull, of which the measurements are:—Length, 16 m. 50; width, 2 m. 80.

Originally destined for war purposes, it is now in process of being transformed for commercial usage.

A New Technical Journal.

It is announced that a new technical aviation journal is to make its appearance under the title of "L'Aviation Nouvelle." M. Roidor-Séville will be the technical editor.

My remark re the burning of machines at St. Raphael was particularly apropos, inasmuch as most of the papers of the 22nd ult. devote considerable space to the information which had reached them from Nice.

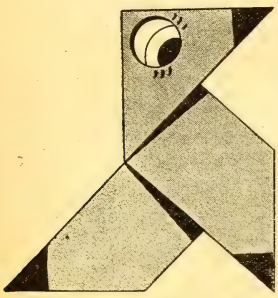
In 1913 M. F. Roidor-Séville organised the first Congress of Human Flight at the Grand Palais, at which 52 representatives of European countries were present. There was to be another congress in 1914, but the war intervened. Several members are no more, but the remainder have been convoqués and have resolved to continue the good work.

F. T. N.

A PARIS EXHIBITION OF AEROPLANE MARKINGS.

In the half-empty Trocadero Palace, high on the Passy Hill, a number of aeroplane badges are on view, being part of the aeronautical history museum of the future, foreshadowed in these columns some weeks ago.

These clear-cut devices in vivid simple colouring—for the most part they are bi- or tricoloured—suggest battle, murder and sudden death in a hundred and forty one (so far) whimsical and witty ways.



At odd moments most of us have wondered at the strange and complicated devices which form the design of the majority of armorial bearings and have family crests and have given more than a fleeting thought as to the circumstances and the artists that gave them origin. But as their origin, although happily, not always their meaning, is in most cases obscure, owing to the paucity of data handed down to us from the early Middle Ages, our interest speedily wanes.

Times change, likewise our appreciation and sense of values, thus we find to-day various commissions, honorary and otherwise, engaged in collecting and presenting data which will provide the "meat" portion of the history books of our children's children.

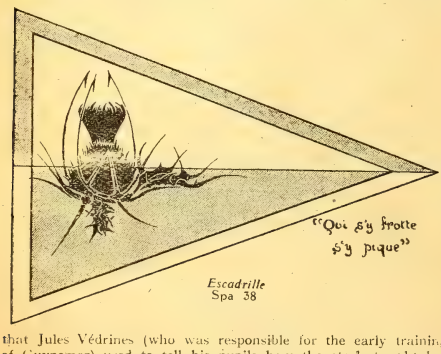
This exhibition, opened on March 20th, organised by Lieuts. Dorville and Piron, is of great documentary value, not only for its variety and completeness, but for the originality of the exposés.

Personal Mascots of Notable French Aces.

Here one may see the personal mascots of the more notable French Aces, as distinct from the squadron badges affixed to all machines of any particular squadron. The collection is further enriched by the inclusion of several American, Italian, and German examples.

The British ones are, I understand, in process of being collected.

Here is the original "Stork" taken from one of Guynemer's machines and known as "Old Charles." It is recorded



that Jules Védrines (who was responsible for the early training of Guynemer) used to tell his pupils how the stork taught her brood to fly by pushing them to the edge of the nest, making them flap their half-fledged wings and in time leaving them to shift as best they could for themselves; whether he left Guynemer to a like fate is not recorded.

At any rate, Guynemer determined to make the stork his mascot—and later it was, and still is—the ensign of the incomparable No. 3 Squadron. Incidentally, I noted that over thirty squadrons had adopted this bird of good omen as their mascot—the design only differing in attitude.

Emblems of Death.

Next in point of interest is the original from Nungesser's machine. On a black, heart-shaped background can be seen a coffin, skull, crossbones, guarded by two lighted candles, thus exemplifying the vigilance of death as personified by Nungesser. This original is taken from his Nieuport single-seater No. 1805, in which he fought 100 combats, and was officially credited with 21 victims, between November, 1916, and July, 1917, taking part in the battles of the Somme, Aisne, and Flanders.

The machine was a type XXVII, specially made for him and fitted with a 50-h.p. rotary Clerget-Blin. Another personal relic belonging to Lieut. Nungesser is that of the SPA. 65 Squadron,

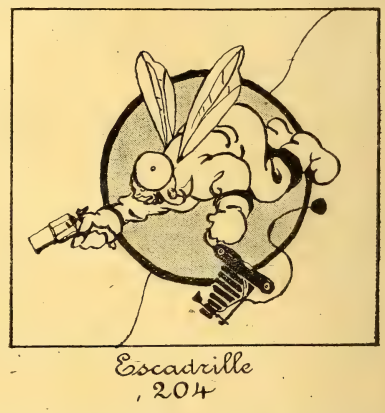


to which he was later transferred, and which gained four army citations and the *fourragère* to its military colours.

Another original is that belonging to 227 Squadron, which consists of the rugged features of an old Gaul, with carroty hair and ear-rings, coupled with a Fee-fo-fi-fum expression.

Armed with a Verey Pistol and Camera.

One of the most amusing is that of Squadron 204 with a winged Ack Emma, apparently ambidextrous, in the act of firing a Verey



pistol and taking photographs. Possibly the wittiest example is that of Squadron Spa. 38, by which, in translation, one reads that "Whoever dares to touch gets pricked"—certainly a fearsome-looking thistle—and the R.G.A. have mounted the head of Clemenceau on the body of a bulldog with a tricolour cockade background, very pretty and effective: then there are the American ones, breathing defiance and damnation from every line; thus one, entitled, "Who said rats?" relates to a black cat on a nearly black flag and another, also American, is a horseman charging the Devil.

Mythology has entered but little into the artists' imagination, although there are a few examples of winged horses and other pre-historic monsters, and Satan—but is Satan a myth?

Anyway, mascots and distinguishing insignia have been evolved for the most part from quite prosaic and unimaginative sources, such as bees, ducks, eggs, chicks, cats, parrots, rabbits, snails, storks, cocque d'or, owls, crabs, elephant, tiger, porcupine, shamrock, turtle, hawks and, dare I say it? a rocking-horse!



To the "Blasons de guerre" of the late Capt. Guynemer and the late Major Lufberry (of the Lafayette Squadron) are affixed each a golden palm-leaf, rosetted with the symbolic tricolour.

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THE TRANS-ATLANTIC COMPETITION.

The British Air Ministry Machines.

At the Felixstowe depot of the Royal Air Force preparations are being made for shipping to Newfoundland the triplane flying boat known as the "Felixstowe Fury." This machine was designed by Lieut.-Colonel J. C. Porte, C.M.G., R.A.F., who, it is understood, will act as navigator.

It is understood that the start will be made from St. John's, Newfoundland. Intermediate stops for fuel will be made at the Azores and possibly Lisbon.

A crew of five will be carried, consisting of two pilots, a navigator, a wireless operator and a mechanic, whose chief duty will be to attend to the petrol supply.

A series of important tests is being conducted in the airship R34 at Glasgow. It is proposed to redope the outer covering of the balloon, which, however, successfully withstood a severe snowstorm during the flight to Ireland. It is expected that the airship will attempt the Atlantic flight in May or June.

The Aero Club of America has announced the reception of a cable from the British Air Ministry, in which it is stated that the Air Ministry is considering the club's invitation to fly one of its airships across the Atlantic to the Pan-American Aeronautical Exposition at Atlantic City in May.

The Martinsyde Machine.

The machine which has been entered by Martinsyde, Ltd., for the Atlantic flight competition is fitted with dual control, and follows closely the F4 type. A Rolls-Royce "Falcon" engine, developing 285 h.p., is fitted, giving the machine a cruising speed of 100 m.p.h. with a good reserve.

It has a wing span of 41 ft. and a length of 26 ft. The machine contains one petrol tank of 370 gallons capacity.

In January, Captain Morgan, R.A.F., the second pilot and navigator, went to Newfoundland to make arrangements for the flight and to choose a flying ground. He subsequently returned to England and left London again on Sunday, March 30th, for Liverpool and Newfoundland. The machine left Liverpool en route for St. John's, Newfoundland, on March 27th.

Mr. Raynham intends steering a course from St. John's to Dingle Bay, County Kerry, and then altering course direct to Brooklands, passing over Bristol. This will mean a non-stop flight of 2,400 miles, which, with favourable weather conditions, Capt. Morgan hopes to cover in 22 hours. Capt. Morgan qualified as a pilot in 1914.

The Fairey Entry.

The Fairey Aviation Co. have lodged an entry with the Royal Aero Club, and have nominated Lieut. Sydney Pickles, late R.N.A.S., as pilot. A navigator has not yet been selected. The machine entered is a 3c type float seaplane, fitted with a Rolls-Royce "Eagle" engine. It has a wing span of 46 ft. 6 in. and a length of 36 ft. The petrol tank is of 385 gallons capacity.

Sopwith Preparations.

A message from St. John's, Newfoundland, states that in connection with Mr. H. G. Hawker's projected attempt to make a Trans-Atlantic flight, the Sopwith Aviation Company's agents are building a large, wooden shed in which to house two aeroplanes, which are due to arrive from Digby, N.S., at any time now.

The agents say that they can assemble the machines, one of which is for trial purposes only, within a week. Then will come a series of short flights to determine the air conditions.

Messrs. Hawker and Grieve, who arrived at St. John's, N.F., on Sunday, March 30th, with the Sopwith aeroplane for the Trans-Atlantic flight, began assembling the various parts of the machine on Monday, March 31st, which task they expect to complete within a week. They will then make experimental flights, and propose to begin their Trans-Atlantic flight at two o'clock in the afternoon on April 16th, because, with the full moon on that night, they will have only seven hours to spend in darkness in mid-ocean. They hope to reach the British Isles by the following forenoon. They estimate that the distance can be covered in nineteen hours if all goes well.

The Duke of Atholl's Views.

Referring at the annual meeting of the Royal Aero Club, on Monday, March 31st, to the "Daily Mail" £10,000 prize for a Trans-Atlantic flight, the Duke of Atholl said that he had no doubt that success would attend the attempts at an Atlantic flight which would be made in the next few months.

It must be regarded as a very important step in civilian aviation, although at the present time it must be regarded as a sporting event brought about by the broad-mindedness of Lord Northcliffe, the vice-president of the Club. It was of interest that the majority of the entrants were from this side of the Atlantic, with British-built machines, and he hoped that the laurels would be gained by a Briton, on a British-built machine, with a British engine.

An Attempt Abandoned.

Captain Sundstedt announced on Friday, March 28th, that he had decided to abandon his attempt to make a Trans-Atlantic flight with the seaplane "Sunrise." He states that his financial backers should not have permitted other aviators than himself to fly the "Sunrise." The result of their doing so was that it fell into Newark Bay, causing damage which will require much time to repair.

The American Preparations.

According to the American newspapers, the machines entered by the United States Navy Dept. will attempt a Trans-Atlantic flight on the first clear day in May, or as soon thereafter as the fog enveloping the Newfoundland coast begins to clear.

Charts for the guidance of the aviators are being made from data compiled by the United States Weather Bureau. The machines will probably carry a crew of five, including pilots, mechanics, a wireless operator, and possibly also an aerographer. Mother-ships fitted out for the care and repair of the flying boats will be employed in addition to destroyers, and alternative routes have also been chosen.

Exact details are not to be published until immediately before the flight. The distance between the starting point in America and Newfoundland is 1,300 nautical miles, and from Newfoundland to Ireland about 1,800 nautical miles.

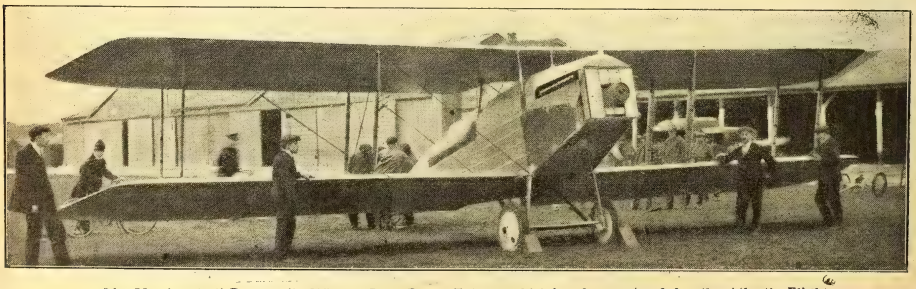
A question of etiquette has arisen in regard to the forthcoming attempt by United States Naval aviators to fly across the Atlantic. The Acting-Secretary for the Navy, Mr. Franklin D. Roosevelt, considers it impossible for the United States Government to compete for or to accept the "Daily Mail" prize of £10,000 for the first Trans-Atlantic flight.

The Aero Club of America, on the other hand, is anxious that America should win the prize, and its president, Mr. Alan R. Hawley, announced on March 30th that if the Navy Department will give its consent he and other members of the Aero Club will contribute to ensure the £100 entrance fee in order that the prize may be awarded to the Naval aviators if they succeed in crossing the Atlantic.

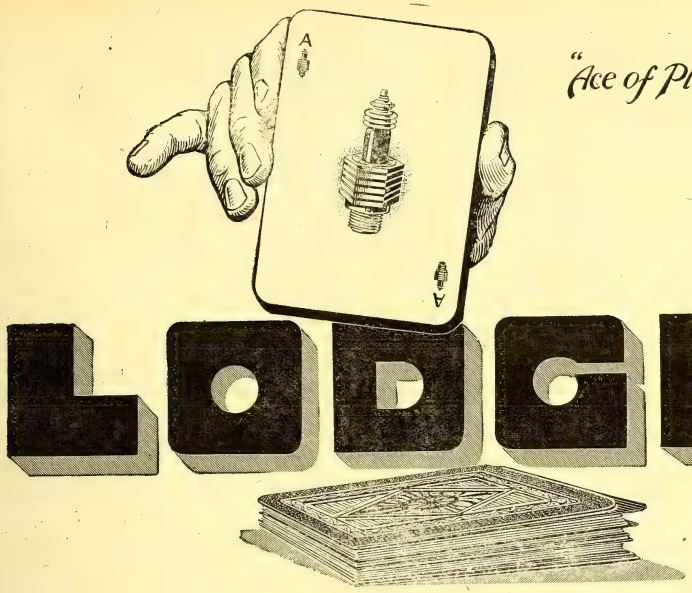
Mr. Hawley added that the prize, if won, might then be given to whatever charity the Navy Department selected, his own suggestion being the American Red Cross or some other organisation which promotes the comfort of men of the Navy.

Mr. Hawley's offer was brought to the notice of Mr. Roosevelt, who said:—

"We appreciate the spirit in which the offer was made, but cannot see how it could be accepted, or how the American Navy could be a contestant for a prize given by private enterprise."



The Martinsyde "Raymor" (285 h.p. Rolls-Royce Falcon) which has been entered for the Atlantic Flight.



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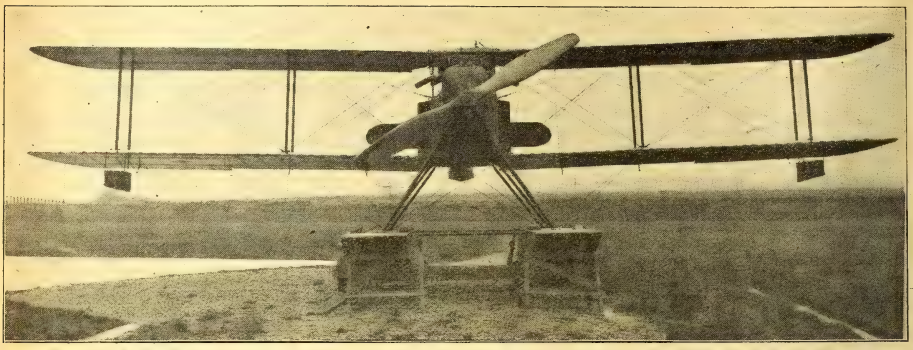
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Front View of a Fairey III.c. (360-h.p. "Eagle" Rolls-Royce). More or less of the type entered for the Trans-Atlantic Competition.

French Civil Aviation Trials.

In order to encourage commercial and touring aviation, the "Echo de Paris" is offering £12,000 in prizes for a series of trials in which safety and comfort will be the chief considerations.

The course will consist of about 20 stages totalling 2,500 miles. It will cross the principal towns in France and will extend to all neighbouring countries except Germany.

This is a very sporting offer and is likely to prove quite as beneficial as, if not more so than, the £10,000 offered by the "Daily Mail" to the first aviator to fly across the Atlantic.

An Exhibition of Aircraft Photographs.

An interesting exhibition illustrating the work of the Royal Air Force was opened at the Grafton Galleries on Tuesday, April 1st, and will remain open until May 31st.—More than 200 photographs in colour will be on view.

A Giant French Seaplane.

In a French Naval dockyard the trials have been taking place of a giant seaplane, which was originally intended for war purposes, and which has now been converted for commercial use. The first trials have given excellent results, according to Reuter, and in a few days the machine will be ready to take the air.

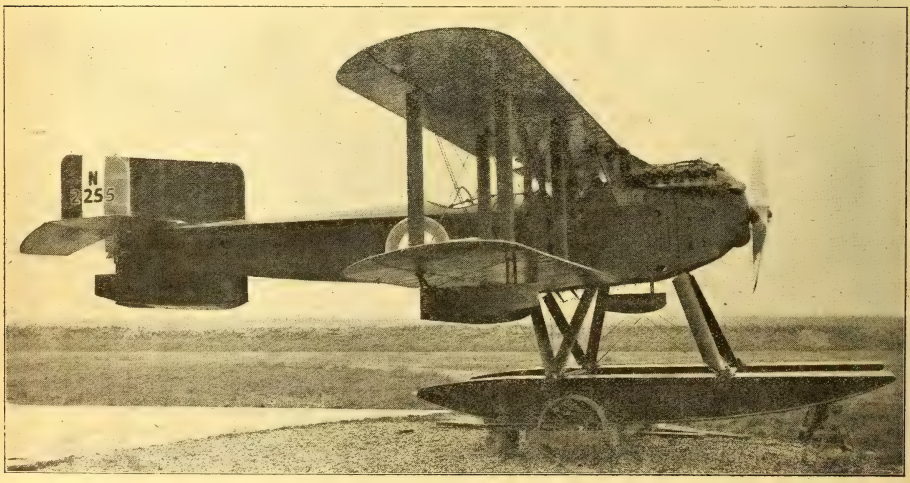
The following are the principal characteristics of this new type:—Span, 106ft. 8in.; length, 55ft.; height, 21ft. 4in.; width of wing, 12ft. 8in.; width of wing at tip, 15ft. It is driven by three 12-cylinder motors of 400 h.p. each, which drive three propellers, two at the rear and one in front. The body of the machine, which is 55ft. in length and 9ft. 4in. wide, will accommodate 30 passengers. The three motors require 235 litres (about 52 gallons) of petrol an hour.

The speed is from 78 to 93 miles an hour, and an uninterrupted flight of 10 hours can be made, as two petrol tanks holding 1,110 litres (about 245 gallons) of petrol each are carried. The machine, which has been christened "Orien," will be piloted during its trials by M. Jean le Borgne, chief naval pilot.

Aerial Taxis.

The first aerial taxi depot in the world will be established within the next two months at Garden City, Long Island, New York, according to Mr. Glenn H. Curtiss.

Mr. Curtiss said: "We shall have a taxi depot which will furnish small machines for short inter-city travel, anything less than 200 miles, on order. Experienced pilots will be available to drive these aeroplanes, and the total cost will be surprisingly low. It certainly will not exceed that of a motor-car trip, for we save on the pilot's and the aeroplane's time even if we may have a larger running cost to meet."



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AIRCRAFT IN PARLIAMENT

The following oral answers were given on March 24th :—

LOCH DOON AERODROME.

Sir S. ROBERTS asked the Under Secretary of State to the Air Ministry what was the total expenditure incurred at Loch Doon; whether the saleable plant and other assets have been removed; and what was the amount of the proceeds of sale arising therefrom?

The UNDER SECRETARY OF STATE FOR AIR (Major-Gen. Seely): The total expenditure to February 19th, 1919, was £484,433. In this figure I do not include the cost of land, and compensation to tenants is not included. The saleable plant and other assets have already been largely removed, being either transferred for Government purposes elsewhere, or sold to other purchasers. The value of materials disposed of in these ways will amount, when removal is completed, to an estimated total of, approximately, £210,000.

Mr. J. JONES: What was the amount of sacrifice that the landlords have made?

Major-General SEELY: I have not got the figures for the land.

AERIAL COMMERCE (DOMINIONS.)

Mr. HURD asked the Under Secretary of State to the Air Ministry what measures he is adopting to carry out his undertaking to keep in touch with aviation progress in the Dominions; and whether, seeing the vital part taken by Canada and other Dominions in the air triumphs of the War, and the necessity of developing inter-Imperial commerce and communications by aviation, he can devise means to bring the Governments of the Dominions into intimate working association with his Ministry?

Major-General SEELY: The Dominions have been asked for suitable officers to be appointed for liaison between their respective Governments and the Air Ministry. Certain of these officers have taken up their duties and are the channel for assisting a complete interchange of information and views.

With regard to aerial commerce and communications within the Empire representations of the Dominions and India in Paris are assisting the air section of the British Peace Delegation, and their co-operation has been of great help in the consideration of the International Aerial Convention and the regulations and rules of the air. The Dominions concerned are also being consulted by the Department of Civil Aviation on the subject of aerial communication and routes and every endeavour is being made to keep in close touch on these subjects.

* * *

The following written answer was given on March 25th :—

DEMOBILISATION (WIRELESS OPERATOR.)

Mr. IRVING asked the Secretary of State for War whether Corporal V. C. Spain, wireless operator, Royal Air Force, attached 90th Brigade, Royal Garrison Artillery, British Expeditionary Force, enlisted in September, 1915, and submitted the necessary certificate from the postmaster of Dover to the headquarters of the squadron during the week ending January 18th, 1919; whether the Royal Air Force authorities say he can only be demobilised by the Royal Garrison Artillery, whether the Royal Garrison Artillery say it is nothing to do with them, as he belongs to the Royal Air Force; and whether he will issue the necessary instructions to settle the question of authority?

Major-General SEELY: This case is for the Air Ministry to settle, that Ministry being responsible for all Royal Air Force personnel—the name of Corporal Spain has been registered for release, and he will be released as soon as the exigencies of the Service permit.

* * *

The following oral answer was given on March 27th :

WOMEN'S ROYAL AIR FORCE.

Mr. THOMAS GRIFFITHS asked the Under Secretary of State to the Air Ministry if Mirabelle Hallan, a member of the Women's Royal Air Force, was detained in a cell at Redcar for three and a-half days because there was no resident magistrate's clerk in Redcar; whether the charge brought against this woman was dismissed; whether he proposes to take any action against those responsible for wrongly accusing this woman; and whether he will consider the possibility of granting her compensation for the financial loss sustained by her as a result of being kept in prison for this period on an unfounded charge?

The UNDER SECRETARY OF STATE FOR AIR (Major-General Seely): Miss Mirabelle Hallen was guilty of a breach of her contract of service, namely, refused to perform her duties, and, after being several times warned, was handed over to the civil authorities in accordance with the terms of the contract. The action of the civil authorities has already been dealt with in the reply given on behalf of the Home Office on the 24th instant.

* * *

The following written answers were given on March 27th :—

ANTI-AIRCRAFT FORCE.

Lieut.-Col. BURGOYNE asked the Secretary of State for War if he will state what recognition the War Office proposes to give to those officers and men who, night and day, have given admirable service in the Anti-Aircraft Corps in England during the War?

Captain GUEST: It is at the discretion of the General Officer Commanding-in-Chief, Great Britain, to bring to notice such services as he considers are deserving of recognition. The most favourable consideration has in the past been accorded by the Army Council to all recommendations proposed for Anti-Aircraft Corps in England, and any further services brought to notice will receive due consideration.

Mr. RAMSDEN asked the Secretary of State for War whether he can state the present duties of the Anti-Aircraft Force in this country; and whether he will take steps to demobilise the officers and men attached to it, especially those whose duties are to protect towns and munition areas inland?

Mr CHURCHILL: The present duties of the Anti-Aircraft Force in this country are to maintain the anti-aircraft defences so that they can be made efficient in a short time in case of necessity. Both officers and men of the anti-aircraft defences have been demobilised as far as possible, and only the number required to keep in order the guns, aeroplanes, and searchlights and general organisation are now being retained.

MISS DOUGLAS-PENNANT.

Brig.-General Sir OWEN THOMAS asked the Secretary of State for War whether, in fulfilment of the promise he made to the House, he has consulted the Prime Minister with regard to the publication of the Report of the hon. Member for Luton on the enquiry made by him, at the Prime Minister's request, into the circumstances surrounding the summary dismissal of Miss Violet Douglas-Pennant from the commandantship of the Women's Royal Air Force?

Mr. CHURCHILL: I have consulted the Prime Minister and also the hon. Member for Luton. The Report was written as a confidential Paper for the personal information of the Prime Minister. In the interest of the public service, there is the strongest objection to the publication of such a document.

* * *

The following written answers were given on March 26th :—

DEMOBILISATION.—APPLICATIONS FOR RELEASE.

Viscount WOLMER asked the Secretary of State for War whether he was aware that Sergeant Meek C. F. Ford, No. 204691, is still being retained in the Air Force at No. 21 Kite Balloon Base, Lerwick, Shetland, although he joined the Royal Naval Air Service in May, 1915, and has been applied for through the Labour Exchange by Messrs. Bowditch and Ford, builders and contractors, of South Farnborough, Hants, who have urgent work waiting for him to do; and whether, in view of the urgency of the building problem at the present moment, he will give instructions for Sergeant Meek Ford to be immediately demobilised?

Major-Gen. SEELY: I am obtaining the necessary information from Lerwick, and will acquaint my Noble Friend with the decision reached.

Major HENDERSON asked the Secretary of State for War whether he was aware that Dr. D. Carmichael, Laurieston House, 2, Albert Drive, Pollokshields, Glasgow, applied unsuccessfully for the release of his assistant, Lieutenant Morris Hyman, M.B., Royal Air Force, Headquarters 23rd Squadron, Dover, although his appeal was backed up by the local war emergency committee; and whether, in view of the shortage of medical practitioners in Glasgow and the prevalence of influenza there, he will agree to have this decision reversed and the above-named officer released?

Major-Gen. SEELY: So far as I can ascertain, no application for the release of Lieutenant Hyman has been received by the Air Ministry, the Ministry of National Service, or the Scottish Central Professional Committee Medical officers are released from the Royal Air Force in a definite order of priority. Lieutenant Hyman, who is a newly qualified medical man, aged twenty-six, joined for duty on November 17th, 1918, and I regret that I do not consider that the circumstances would warrant my granting any special priority in his case

ROYAL AIR FORCE.—LONDON-BOURNEMOUTH FLIGHT

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry whether a Service aircraft, believed to be a Nieuport Nighthawk, flew from London to Bournemouth on March 14th with newspapers; whether this is in accordance with the Regulations; and by whose authority this flight was carried out?

Major-Gen. SEELY: The machine in question was being constructed for the Royal Air Force by a firm of contractors, and was undergoing the customary "Maker's Test," consisting of a four-hours' flight carried out by the firm's pilot. No particular route was specified. The Regulations at present in force prohibit civil aviation except when carried out under Naval or Military instructions. In the present case instructions for the flight were issued by the Air Ministry authorities, but no permission to carry newspapers was either asked or granted, and the firm in question have been informed that the Air Ministry cannot permit such action pending the re-opening of civil aviation.

MISSING OFFICERS.

Lieut.-Col. DALRYMPLE WHITE asked the Under Secretary of State to the Air Ministry if the names of Lieut. W. Hodgkinson, observer, Royal Air Force,, and of Capt. Lynn Campbell, pilot, Royal Air Force, who were reported as missing after a flight in machine B.F. E2,256, on October 9th, 1918, were included in the list of 2,900 missing men sent to the German Government about February 28th, 1919; whether any information has been received as to the fate of these two officers; and whether he can now state the objective of this aeroplane on October 9th, 1918; so that private inquiries can be made by the parents?

Major-Gen. SEELY: The list recently sent to the German Government included only names of men definitely known to have been prisoners. The names of the two officers mentioned in the question do not come into this category, and were not included in the list. No information has been received regarding Lieut. Hodgkinson. An unofficial and unconfirmed report states that Capt. Campbell was killed. I regret that I am unable to indicate the probable place of descent of the aeroplane, as this might be miles away from the locality over which it was last seen. I have ascertained that this locality was the Foret de Mormal Further inquiries into this and similar cases are being made.

* * *

The following written answer was given on March 28th :—

AIRCRAFT DISPOSAL DEPARTMENT (LINEN.)

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry how many yards of linen are now in the possession of the Aircraft Disposal Department?

Mr. KELLAWAY: The total stocks of linen in the possession of the Ministry of Munitions and available for disposal is 31,970,725 yards

Relics of Aerial Combats.

The Royal Air Force have established a depot for war relics and trophies at Sports Bank Hall, Sports Bank Street, Catford, S.E.11, where a large amount of interesting and valuable material has been collected. The collection includes relics of air combats, models, and a large number of trophies from Zeppelins and notable enemy machines from France, together with portions of equipment used by British officers in escaping from captivity.

It has been announced in the "Times" that the president of the Royal Air Force section will be glad to receive trophies and relics of all kinds, and photographs connected with the R.N.A.S., R.F.C., and R.A.F., at the above address, as it is desired to make the Air Force Section of the Imperial War Museum as complete as possible.

Readers of THE AEROPLANE who have interesting trophies are asked to assist.

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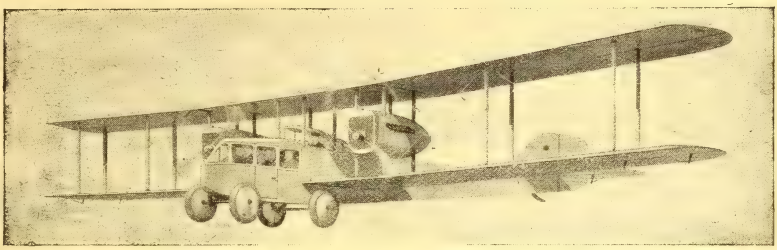
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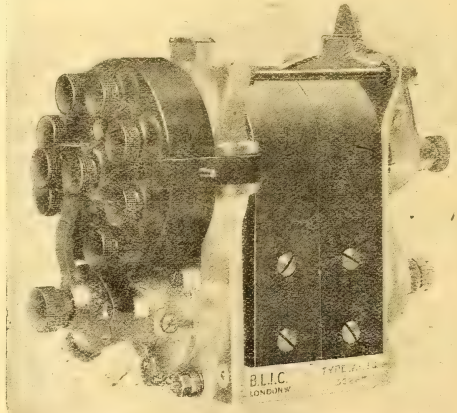
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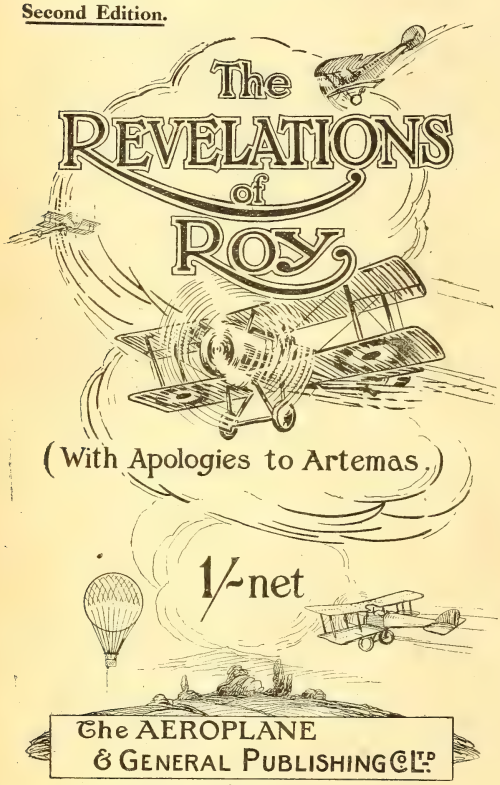
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Extract from Chap. II.

1. And when he was come unto Farn, Roy was compassed about by a great multitude.

2. And he beheld winged chariots of divers designs; thus, there were the Scout, and the Dolphin, and the Martinsyde, and the Camel, even that which produceth the hump.

3. And a man beckoned unto Roy; and on his arm he bare three stripes.

Extract from Chap. XXI (& last).

17. And in all thy ways consider this, that there be two things greater than any other in forming the character of him that flies; and the one is Energy and the other, it is Enthusiasm.

19. And take thou a pride in being an aviator; for hath not the great Hender said, These young men are the salt of the Earth.

20. Go thy way in courage and good cheer; and greet the Great Adventure with a song.

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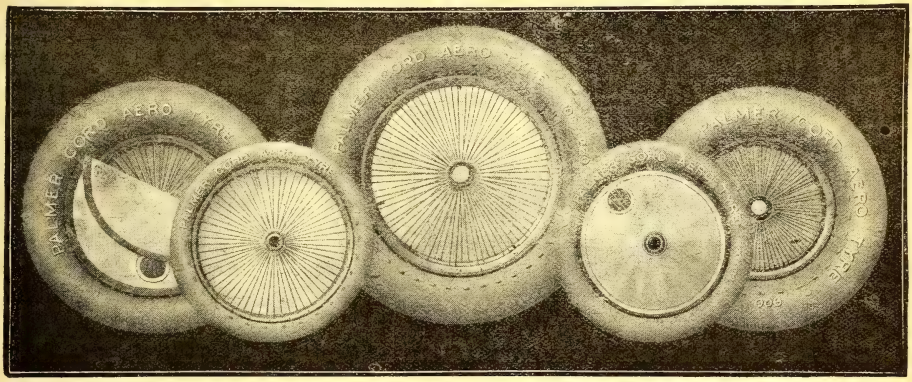
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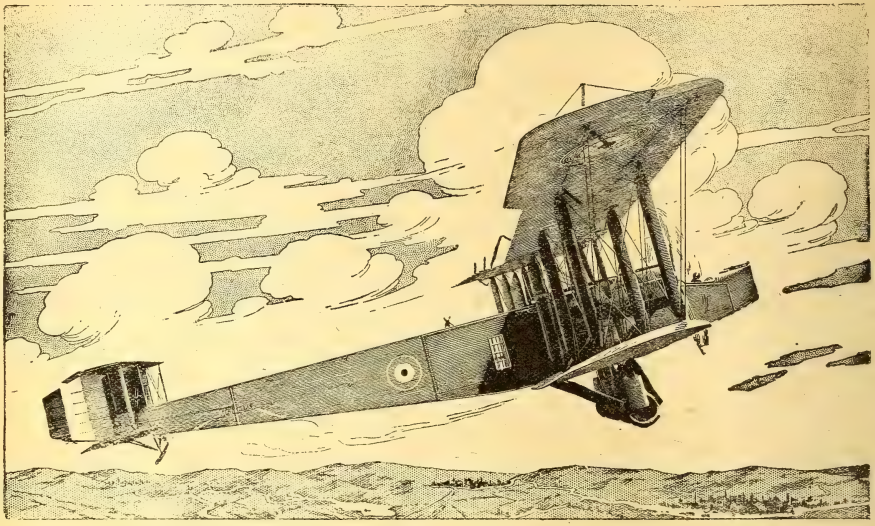
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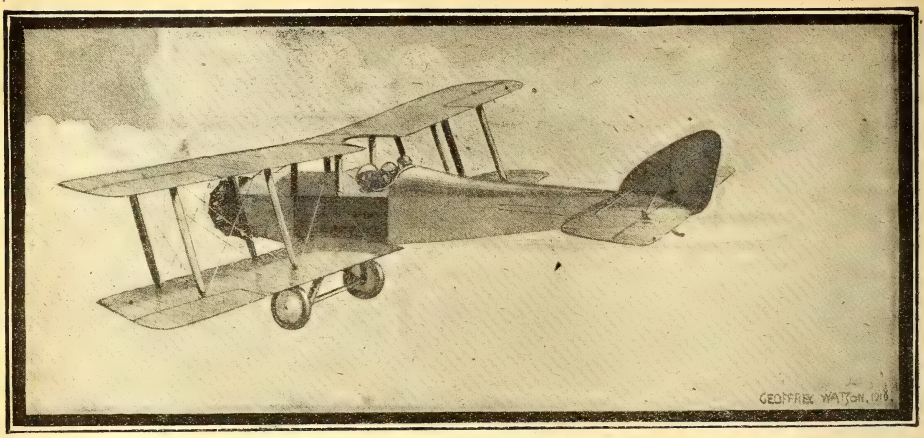
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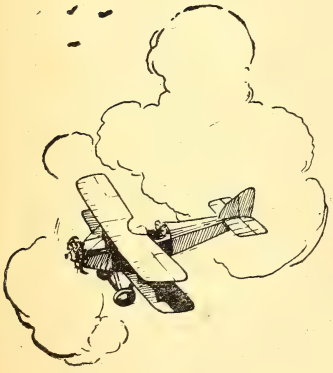
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THE WEEKLY COMMENTARY.

In this week's issue a description of the American version of the Bugatti aero-engine is given.

This engine is designed on extremely unusual lines; it is in essence four four-cylinder engines coupled together. Extremely regular turning effort should be obtained, and the engine should be fairly well balanced.

The arrangement gives a much narrower engine than does the usual V arrangement, with a considerable saving in body head resistance.

It is said that the American type engine has given excellent results on the test bed, but no information has been obtained of any flying tests. Curiously enough, the weight of the engine is nowhere given in the American paper from which the description has been taken.

Captain Sayers has given in this week's issue an interesting comparison as between a conventional type two-seater of normal type and a proposed four-seater of the same overall dimensions.

If the author's claims as to the possibility of using wings which will give the performances that he estimates with the loading specified are substantiated, there appears to be very good reason for using wings of this type for commercial purposes.

The advantages which can be obtained from such heavy loading, and from the consequent reduction in the overall size and the first cost of machines, appear to show that his claims are well founded.

COMMERCIAL AIRCRAFT DESIGN VIII.

SMALL PASSENGER MACHINES.

By Capt. W. H. Sayers, late R.A.F.

The types of machines dealt with so far have all been of very small size and power, and although two of them should be flyable in almost any weather, both the two-seaters would be too lively in bad weather to please the average traveller.

Such machines would therefore be of very little use as commercial passenger carriers for anything but fine weather pleasure work.

There seems fairly good reason to believe that one of the most favourable openings for early commercial aerial transport business will be that of carrying business men in a hurry over distances of from 50 to 500 miles.

For such work an all-weather machine which shall not be too lively in bad conditions is desirable.

Were it possible to obtain the opinion of every one who has had a fair amount of all-weather flying, it is probable that a very large majority would describe an aeroplane very similar in most respects to the one shown in Fig. 14 as the most suitable type for such a purpose.

A very large amount of experience has shown that a machine of roughly the overall dimensions, weight, and general arrangement there shown can be made very comfortable to fly and very easy to fly in all weathers.

Probably a large number of modifications would be proposed to fit the machine for the special purpose.

Many people would suggest a totally enclosed body—say, of the type used by Mr. A. V. Roe in his 1912 Military Trials machine.

Such a body can be built at little extra weight, and even less additional head resistance, but the pilot must also be totally enclosed, and his landing view will be spoilt.

If a hole is cut in the body, allowing the pilot to protrude, the large body then becomes considerably worse in head resistance.

Many would prefer a stationary engine to a rotary. Unless the stationary engine were of the radial type there would be some difficulty in obtaining the disposition of weights which largely help to make this type so comfortable to fly.

But, generally speaking, it is believed that this sketch represents fairly accurately the present-day ideal of a safe and comfortable all-weather machine.

Considered as an aerial "taxi," the type has many good points and a number of drawbacks.

It carries one, or at a pinch two, passengers besides the pilot. A larger machine on the same lines can be made; but if the dimensions are much increased, its qualities of handiness will vanish.

The type of engine generally associated with this class of machine is expensive to build, and requires careful maintenance. It is generally extravagant in fuel and oil, and, although some rotary engines have an excellent reputation, the reliability of such motors is under suspicion.

It would seem that the machine which is required for aerial taxi work should attempt to combine the following features:—

(1) The overall dimensions should not greatly exceed those of the type illustrated in Fig. 14, nor should it differ very widely therefrom in general proportions.

If this condition can be fulfilled, it may be expected that somewhat the same quality of comfort can be secured.

(2) Provision for enclosing the passengers should be integral in the design.

(3) Accommodation for as many passengers as possible should be provided, so that if more than one passenger wishes to make the same journey at the same time the fewest possible machines shall be needed for the purpose.

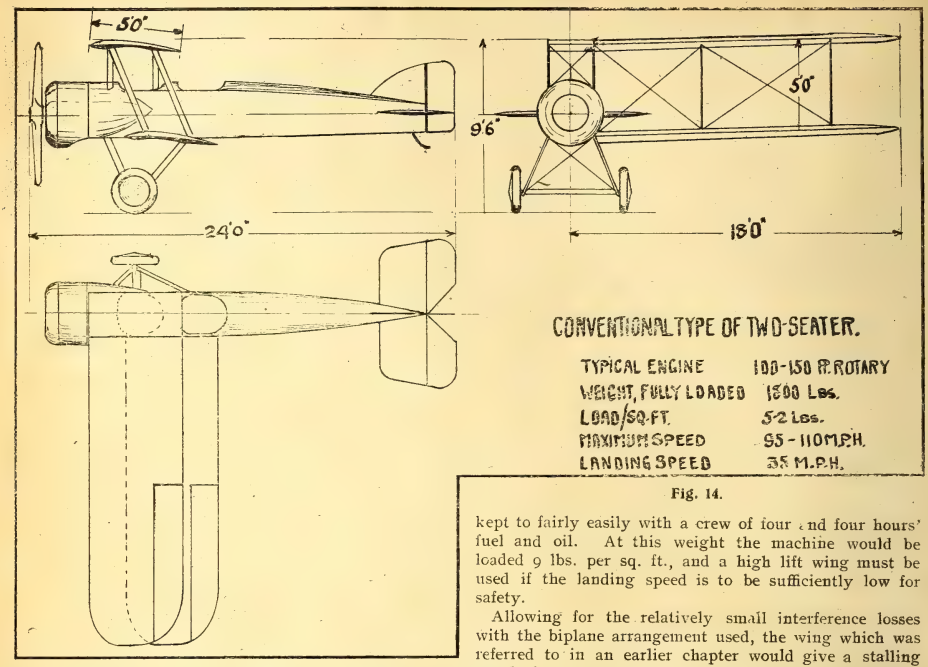


Fig. 14.

It is not beside the point to observe that London taxi-cabs are seated for four in addition to the driver.

(4) The machine should be fitted with a stationary engine of an economical type.

Fig. 15 shows the general arrangement of a machine whose overall dimensions are identical with those of Fig. 14.

The design is based on a 200-h.p. water-cooled 8-cylinder "V" engine, corresponding roughly with the Hispano-Suiza in its dimensions and weights.

The upper wing, of 36 ft. span by 6 ft. chord, has a centre section which runs into the top of the fuselage. The lower wing (30 ft. by 4 ft.) is fitted at the bottom of the fuselage, which is of a depth equal to the gap (4 ft.).

This use of a top plane of large chord, and a lower one of distinctly smaller dimensions in all respects, deserves a word of explanation. Using the same span and the same total surface, the author has found that it is generally impossible to obtain quite such a low total weight of wing spars with equal top and bottom wings as this arrangement allows.

In addition, the small bottom wing naturally interferes less with the air flow round the upper wing than does that of the equal biplane. A smaller gap is therefore permissible for the same aerofoil efficiency, and a considerable saving in the weight of interposed struts can be obtained.

The pilot is seated high up in the fuselage, between the spars of the upper centre section, from which position a very fair view can be obtained. There is room in the pilot's cockpit for a passenger beside him.

Behind the rear spar is an enclosed cabin seating two passengers side by side, fairly low in the fuselage.

In all other respects the machine calls for little comment as to its arrangement.

The estimated full load weight of 3,000 lbs could be kept to fairly easily with a crew of four and four hours' fuel and oil. At this weight the machine would be loaded 9 lbs. per sq. ft., and a high lift wing must be used if the landing speed is to be sufficiently low for safety.

Allowing for the relatively small interference losses with the biplane arrangement used, the wing which was referred to in an earlier chapter would give a stalling speed of 40 m.p.h. at the loading, and a maximum speed of 110 m.p.h.

The initial climbing speed would be about 650 ft. per minute at 55 m.p.h., with a ceiling of not less than 15,000 ft.

The greater total weight, as compared with Fig. 14, would tend to make this machine slower to answer to both bumps and controls. As against this, the wing arrangement used gives less damping than does the equal biplane, and tends to make a livelier machine fore and aft. A considerably larger tail plane is required for stability as compared with Fig. 14, because the larger total weight and a slightly greater effective movement of the centre of pressure require greater stabilising moments, and because the tail lever arm is shorter.

On the whole, this machine would be rather heavier to control than Fig. 14, but lighter than a scale enlargement of Fig. 14 to carry the same maximum load.

It would be rather less lively fore and aft, and rather more lively laterally, in bumpy weather.

It would be in rather better aerodynamical balance than a machine of the conventional type, because the arrangement gives a nearer approach to coincidence between the axes of thrust and centre of resistance and the centre of gravity.

The cost of the machine need not very greatly exceed that of the conventional type. The 200-h.p. stationary engine should cost little more than would a 150-h.p. rotary.

The aeroplane structure of Fig. 15 would weigh about 1,200 lbs. as against about 800 for Fig. 14; but in the main this extra weight would be due to the greater dimensions of all the members, and the total amount of labour required for manufacture would be very little greater.

In all probability the first cost would not exceed that of the conventional type by more than 25 per cent.

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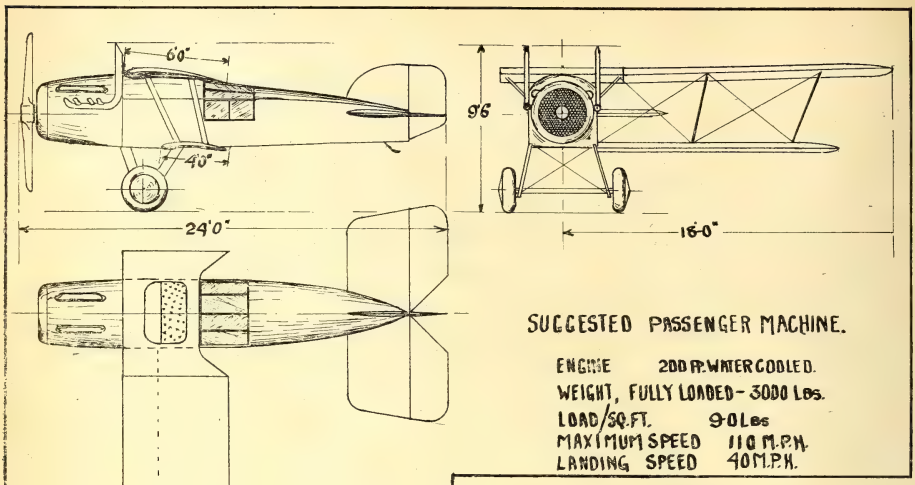


Fig. 15

The housing space required is identical.

Running costs would differ very little. With a rotary of 150 h.p. the fuel power consumption will be about 12 gallons of petrol and 1 of oil per hour for 110 miles with Fig. 14. The 200-h.p. water-cooled engine of Fig. 15 should not consume more than 13 gallons of fuel and ¼ gallon of oil for the same mileage.

The conventional type machine will scarcely carry more than 3 hours' full power fuel; Fig. 15 could carry 4 to 4½ hours' fuel with 3 passengers.

Allowing for the much greater capacity, Fig. 15 would be much the more economical machine.

Carrying the same load as that normal to the conventional type, it would bear a much greater reserve of power, and the engine could therefore be run throttled considerably, with some economy in fuel, and a great saving in engine maintenance costs.

The whole structure would be much more robustly built to fit it for the greater loading, and the machine suggested would have a longer life, and would keep in truth more certainly than does the conventional type.

(To be continued.)

AN INTERESTING COMBINATION.

It is now possible to announce that following his demobilisation from the Royal Air Force, Major F. B. Halford, the co-designer of the 6-cylinder B.H.P. engine, has joined the staff of Engine Patents, Ltd., 21, Suffolk Street, Pall Mall, S.W.1, and left for America on their behalf on the 29th ult for a tour which will last a few months.

Engine Patents, Limited, under the very able technical direction of Mr. Harry R. Ricardo were responsible for the design of the "Ricardo" engines fitted exclusively by the Mechanical Welfare Department in the British Tanks.

The initial secrecy enforced on the subject of these engines has resulted in the light of this company having been somewhat hid under a bushel. Ricardo engines adapted were designed to suit special requirements, and embodied several new features which proved entirely successful. Some thousands of engines were built, and it is fortunate that the experience gained is directly applicable to peace designs. Mr. Ricardo's chief technical co-director is Mr. H. A. Hetherington; the chairman is Mr. A. A. Campbell Swinton, F.R.S.; the managing director, Mr. Campbell Farrar, who is strongly supported on the board by Mr. F. C. Goodenough, chairman of Barclay's Bank; and Mr. Stuart de la Rue, managing director of De La Rue and Co., Ltd.

One associates Major Halford's name with the B.H.P. engine, for the design and development of which he was responsible, in collaboration with Sir William Beardmore and Mr. T. C. Pullinger. This engine, which was built in thousands by Siddeley, Deasy and Co., Ltd., of Coventry, was the lightest six-cylinder engine used by any belligerent, and was largely responsible for the successful bombing of Rhine towns by the Independent Force, R.A.F.

But for the Armistice, the 12-cylinder B.H.P., i.e., the "Pacific" of 550 h.p., would have been produced in very large numbers as one of the standard bombing engines, some thousands having already been ordered.

Engine Patents, Limited, whose operations cover the whole range of internal combustion engines are, one understands, now engaged in designing engines of all kinds—car, lorry, bus, electric light, etc.—for important firms in this country, and they have also already prepared several aero-engine designs for commercial purposes, particularly one of high power for airship work, which is being developed by one of the well-known aero-engine builders, and one awaits with interest the contributions to engine development which such a combination is bound to produce.

AN UNNECESSARY RISK.

A correspondent in the R. A. F. writes:—

"I have come across more than one instance of accident occurring through the practice of propeller-swinging, and I have witnessed quite a number of similar cases during the past two years. Don't you think this is a point which could advantageously be brought to the notice of manufacturers of the present day high-powered aero-engine—especially with commercial aviation so much in the foreground?

"A device which would obviate the 'sucking-in' or 'swinging' of aero-engines does not seem to present a very difficult problem, and, I believe, such an article has been in existence in more than one form for some considerable time. I think that manufacturers should now consider the fitting of what must in future be a component part of every aero-engine. Anyway, I think it is a point worth the consideration of the people concerned, even if they have not had sufficient opportunity of considering its merits during the war."

[This is a matter which engine-makers and others should study. The Napier "Lion" method of starting, as described last week, is neat and light and simple, but not applicable to existing engines. The compressed-air bottle is heavy and clumsy and unreliable. Starting by electric motor from an accumulator is neat but heavy. The method of starting by means of an auxiliary "donkey engine" on a trolley is effective, but only usable on an aerodrome. Therefore, there is much to be done in this direction.—Ed.]



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THE 410 H.P. AMERICAN BUGATTI ENGINE.

The following particulars of the Americanised version of the 400-h.p. Bugatti aero engine are due to the "Aerial Age Weekly," of New York.

The article from which they have been extracted deals much more extensively with the alterations introduced into the design by Mr. Charles B. King than it does with the actual engine, and this description applies in its entirety only to the American type.

It is only fair to Mr. King to say that, so far as can be discovered, the original engine sent to America was an experimental and incompletely-tested type, and that he appears to have made rational alterations.

Generally speaking, the main features and dimensions of the American engine and of the original appear to be very similar.

The cylinders are in two vertical rows, each of eight cylinders, each row driving a separate cranshaft revolving in the same direction. Each crankshaft drives through a pinion at its end a spur-wheel on the common airscrew shaft.

The crankshaft of each row of cylinders is made in two halves, each half being of the standard type for a four-cylinder vertical engine. That is to say, the two central crank-pins of each set of four are in line one with the other, and the two outer crank-pins are also in line with each other, but displaced 180 deg. from the two central pins. The pair of four-throw shafts for each line of eight cylinders are coupled together 90 deg. out of phase, and the two lines are geared together with an angular displacement between them of 45 deg.

The engine is, therefore, so far as regularity of turning movement is concerned, equivalent to four four-cylinder engines coupled together with a displacement of 45 deg. between each crankshaft, and gives eight equally-spaced impulses per revolution.

It is an interesting commentary upon American journalistic methods that, although seven pages of letterpress and diagrams are devoted to the details of the alterations due to Mr King, the above essential features of the Bugatti design are nowhere stated in the whole of the fifteen pages devoted to the engine, and that the relative timing of the two crankshafts is only referred to casually in a note on assembly towards the end of the article This is more noticeable because of the particular emphasis laid upon the importance of an improved accuracy in the timing of the crankshafts alleged to have been introduced by the American re-designer.

The following general specification is given by the "Aerial Age" :—

GENERAL DATA.

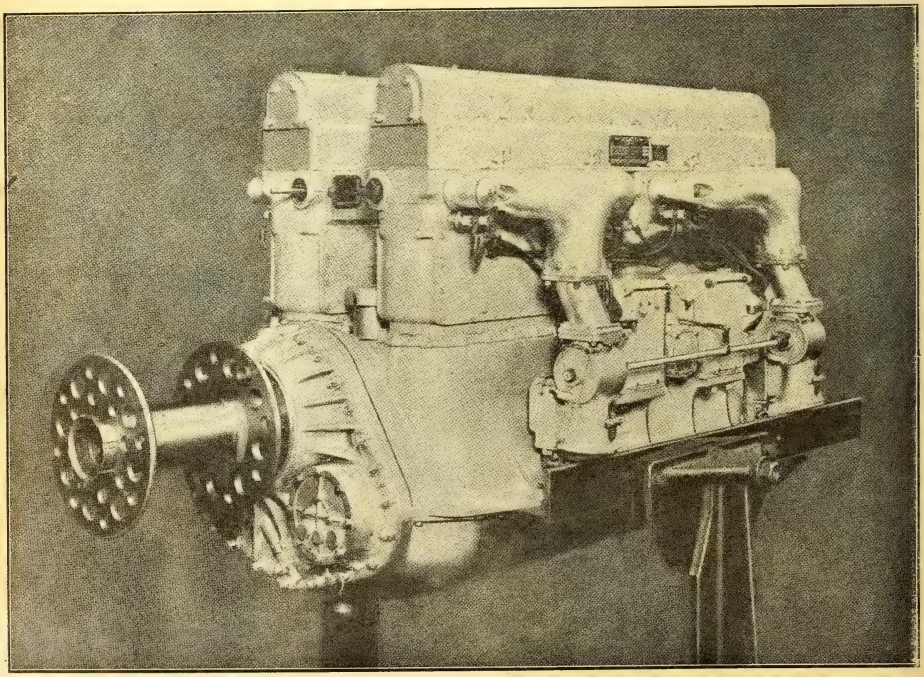
Number and arrangement of cylinders : 16 vertical, 2 rows of 8 in blocks of 4	
Material	Cast iron
Bore	4.33 in. 110 mm.
Stroke	6.3 in. 160 mm.
Stroke-bore ratio	1.455 : 1
Area of one piston	14.725 sq. in.
Total piston area	235.6 cu. in.
Swept volume of one cylinder	92.768 cu. in.
Displacement of motor	1484.288 cu. in.
Compression ratio	5 : 1
Normal brake H.P.	410 at 2,000 R.P.M.
Ratio propeller to crankshaft speed	2 : 3

VALVES.

Number per cylinder	Two inlet and one exhaust
Outside diameter, inlet	1.535
Outside diameter, exhaust	2.263
Port diameter, inlet	1 27/64 in.
Port diameter, exhaust	2 3/64 in.
Angle of seat	10 deg.
Valve lift, inlet	.653 in.
Valve lift, exhaust	.700 in.
Number of springs per valve, inlet and exhaust	2 concentric
Length of spring in position, inlet (small)	2 7/64 in.
Length of spring in position, inlet (large)	2 15/64 in.
Length of spring in position, exhaust (small)	2 27/64 in.
Length of spring in position, exhaust (large)	2 27/64 in.
Valves parallel to centre line of cylinder bore.	

CYLINDERS.

Overall height of cylinders	10 27/64 in.
Length of projection in crankcase	3 1/16 in.
Thickness of flange (base)	7/16 in.
Number of studs per block of four cylinders	20
Diameter of stud	5/16 in.
Thickness of water jacket wall side and head	5/32 in.



Three-quarter view from Airscrew end, 410-h.p. Bugatti Engine.

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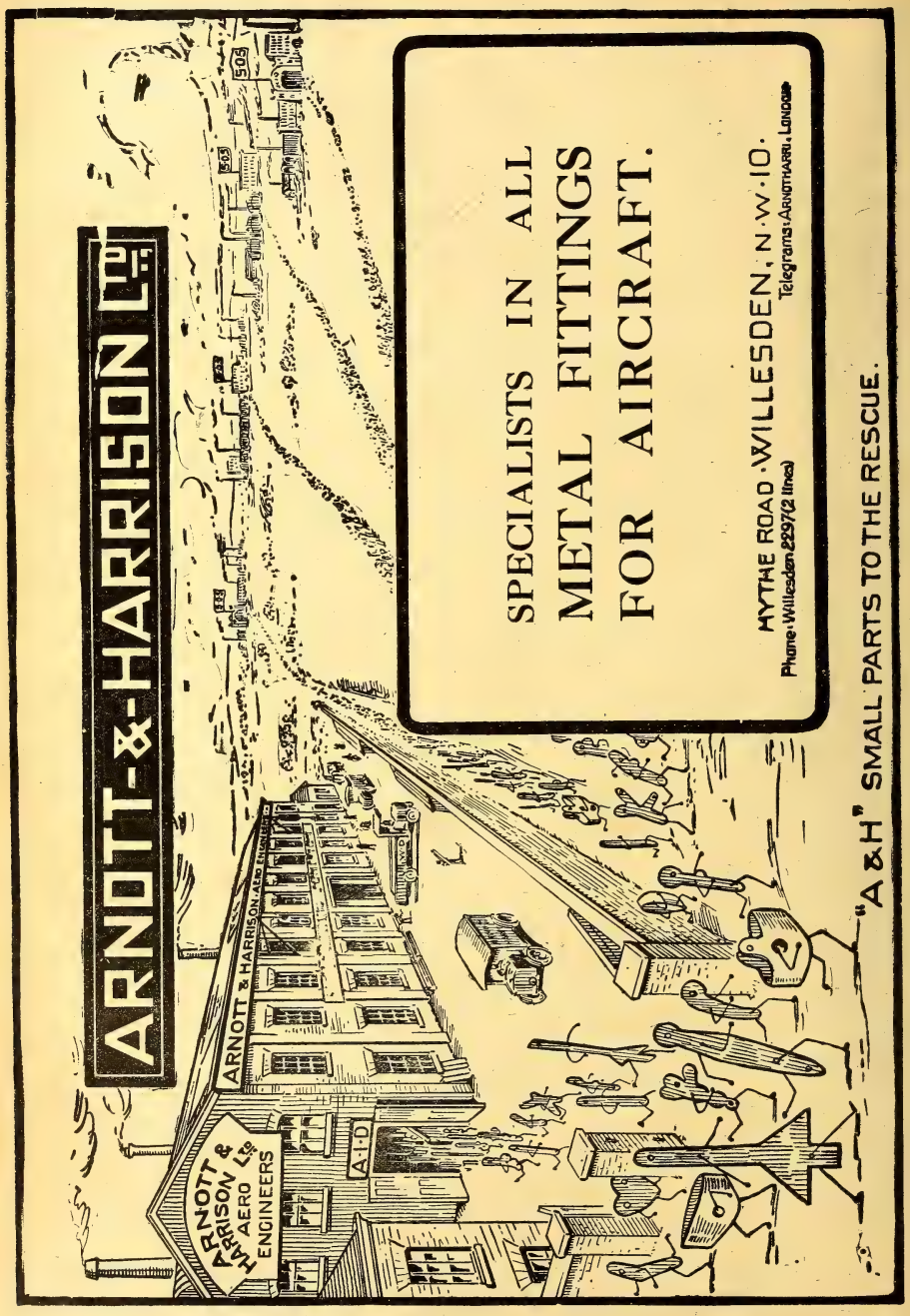
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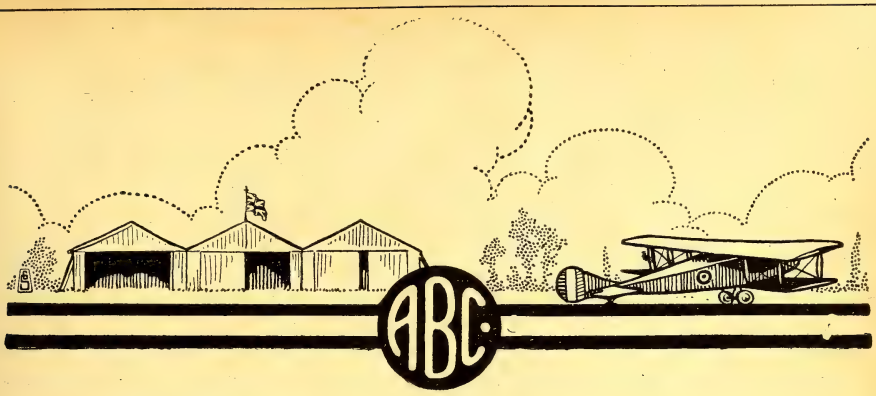
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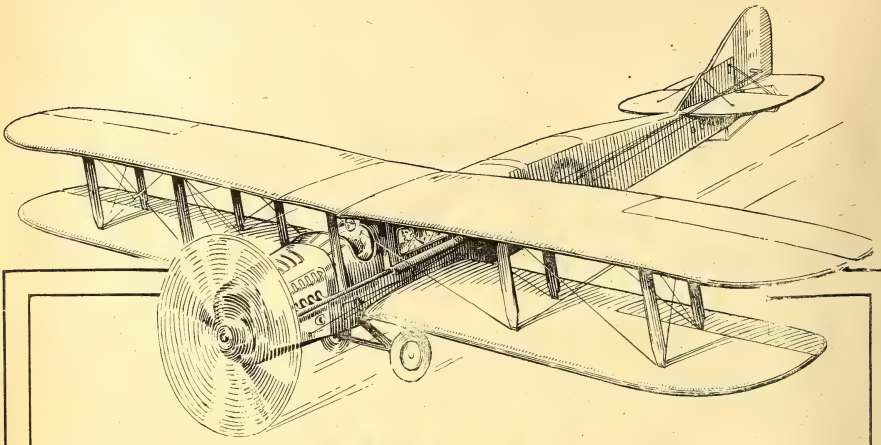
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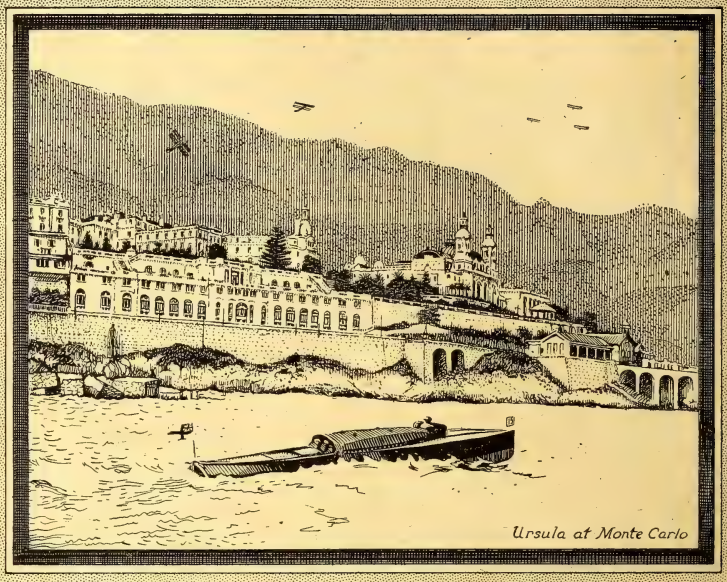
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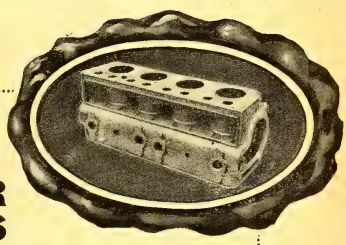
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Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 282 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet, "Martinsyde, Weybridge." Woking 3353 Byfleet 171.

National Aircraft Manufacturing Co, Ltd., 15, Drummond Crescent, Seymour Street, Euston Museum 3373.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London." Willesden 2455

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford" Bradford 3700 (4 lines).

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." Manchester 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 1088 (8 lines).

Standard Aircraft Manufacturing Co., 28, Bow Common Lane, E. East 2823.

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin." Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet." Byfleet 1, 2 & 3.

Thames Aviation Works, 141, Curtain Rd., E.C.2. London Wall 0766.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyta, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft, Yeovil "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Aeroplane Manufacturers (continued)—

Whitehead Aircraft (1917), Ltd., Richmond, Surrey. "Whitecraft, Richmond, Surrey." Richmond 1780-1.

Witton & Witton, 143, Fonthill Road, Finsbury Park, London, N.4. North 2110.

Airships—

Airships, Ltd., High Street, Merton. Wimbledon 1314.

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 378.

C. G. Spencer and Sons, Ltd. (See under "Balloons").

The Willows Aircraft Co., Ltd., Cardiff. "Aircraft, Cardiff." Cardiff 300 (main line).

Aluminium Castings (Sand and Die)

Coan, R. W., 210, Goswell Road, London, E.C.1 "Krankases, Isling, London." City 3846.

The Snercold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Snercold, Kingston-on-Thames." Kingston 1154.

Balloons—

C. G. Spencer and Sons, Ltd., 50a, Highbury Grove, N.5. "Aeronaut, London."

Bent Timber Parts—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London" Museum 496. Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough" Market Harborough 15.

Bearings (Etonia Cast Phosphor Bronze)

Brown Bros., Ltd., Gt. Eastern St., E.C.1. Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds."

Blinds—

J. Avery & Co., 81, Gt Portland Street, London, W. "Velarium, London" Gerrard 6620.

Blowpipes (Oxy-Acetylene)—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1 "Flamma, Vic, London." Vic 4830

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic. 3540 (3 lines).

Bolts—

Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16 Dalston 2500 (2 lines).

Books (Aero Engines)—

Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2

Buildings—

Boulton & Paul Ltd., Rose Lane, Norwich "Aviation, Norwich." Norwich 851

Rubery Owen & Co., Darlaston, South Staffs.

Cable Coverings and Cable Controls—

The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green." Acock's Green 103 & 104

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61

Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4670.

Casein—

T. & A. Duché & Sons, 6, Eastcheap "Duché, London." Avenue 2096.

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3 "Suricodon, Fen, London." Avenue 34 and 35.

Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1366-7.

Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.

Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, 'Phone, London." Hampstead 2403 & 4404.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Aeros, Richmond." Richmond 1681.

The Snercold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Snercold, Kingston-on-Thames." Kingston 1154.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England "Thompson Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 4046.

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London" Gerrard 280.

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 440.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham, Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1910.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London." Gerrard 8026.

Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1. "Rolhead, London." Gerrard 1654-5-6.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 985.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames." Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1084.

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7 "Juno, London" Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London" Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 981.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London." Willesden 2480.

Electric Cables—

E. Kalker and Co., Coventry "Kalker, Coventry." Coventry 248.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London" Central 2207; London Wall 1564.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London" Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Fluxes—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

Buyers' Guide.



Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Flying School—
The L. & P. Aviation Co., Stag Lane Aerodrome, Edgware. Kingsbury 102.
Avenue 995, 996, and 7996.

Furniture (Office)—
Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2.
London Wall 573 and 6170.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham."
East 407.

Glue—
Cannon, B., & Co., Ltd., Lincoln London Office, 110, Cannon Street, E.C.4. "Beccolin, Cannon, London."
City 1206.
Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid.) "Excroiden, 'Phone, London." Avenue 4611-2.
Mendine Co., 8, Arthur Street, E.C.
Bank 5873.

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Hack Saw Blades and Machines—
Victor Saw Works, Ltd., 2 and 3, West Street, Finsbury Circus, London, E.C. "Vicsaw, Phone, London."
London Wall 1880.

Heating and Ventilating—
Chas. P. Kinnell and Co., Ltd., 65 & 65a, Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London."
Hop 703.

Hollow Spars—
McGruer Hollow Spar Co., Ltd., Commercial Road, Lambeth, S.E. "Ollospairs, Watloo, London." Hop 718.

Instruments—
British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

Leather for Aeroplanes—
George Angus & Co., Ltd., Newcastle-on-Tyne. City 72 Central 9567. Quayside City 72.

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London. "Pegamoid, Cent., London." City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—
W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicoto Fen, London. Avenue 7854 (2 lines.)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, Phone, London."
Museum 430.
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asteroidal, Coventry." Coventry 278.
The M.I. Magneto Syndicate, Ltd., Coventry. "Corlton, Coventry."
Coventry 1008-1009.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 599 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43.
Avenue 1432.

Metals in General—
Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.
Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London."
Avenue 995, 996, & 7996.

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury."
Oldbury 111 (4 lines)
Aircraft Supplies Co., Ltd., Ascot House, 125, Long Acre, W.C.2. "Upcast, Rand, London." Gerrard 276 (2 lines).
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds."
Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1 "Installing, Eusroad, London." Museum 70.
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London."
Holborn 410
The Sherecold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Sherecold, Kingston-on-Thames." Kingston 1154.
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selaero, Phone, London." Regent 1181.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London."
Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast."
Belfast 4933-4934-4035.
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London."
London Wall 6300.
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham."
Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow Tapes, Cords, and Threads. City 3115.

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Mann, Egerton & Co., Ltd., 279/281, Euston Road, London, N.W.1. "Manegecar, Eusroad, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry."
Coventry 530 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—
C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London." Central 11305 & 13466.

Parachutes—
E. K. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.
C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—
British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds."
Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich, "Aviation, Norwich." Norwich 851.

Propellers (continued)—
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames "Ebora, Kingston." Kingston 672.
Integral Propeller Co., Ltd., "Aviprop, Hyde, London."
Hendon 9. Kingsbury 104
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich."
Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.
The Pegasus Aircraft Co., Ltd., Tritterdown Street, Tooting, S.W.17.
Streatham 1242.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster instruments, Letchworth." Letchworth 26

Radiators—
Gallay Radiator Co., Ltd., 198, Great Portland Street, W.1 "Galyradico, Wesdo, London." Mayfair 4826.
John Marston, Ltd., Sunbeamland, Wolverhampton. "Sunbeam, Wolverhampton."
Wolverhampton 46 and 206.

Rawhide Hammers—
Ira Stephens, Whitelands Leather Works, Ashton under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield."
Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 26b, Goswell Road, London, E.C.1 "Masticator, Isling, London." City 3811 & 3812.

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester "Semloh, Manchester."
City 4432.

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch."
Redditch 74.

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds."
Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich."
Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London."
Willesden 2480.

Shackles—
British Gold Shell Ring Co., Ltd., Hounslow, Middlesex. "Golshel, Hounslow." Hounslow 254.

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury."
Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds."
Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830.
British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selaero, Phone, London."
Regent 1181.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).
The Sherecold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Sherecold, Kingston-on-Thames."
Kingston 1154.



The · Aeroplane ·

Acceptance and Experimental Flights—

The Frobisher Aviation Company. "Aeromma, Piccy, London." Gerrard 578 (2 lines).

Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The, 29, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." 3540 Victoria (3 lines).

Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Armanship, Hyde, London."

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle - on - Tyne. "Armstrong Aviation, Newcastleon-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3000.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hampstead 5551.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 3103 and 3424.

Davidson Aviation Co., Ltd., Hammersmith, W.6. Hammersmith 1092 (3 lines).

Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2004 (2 lines).

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1170.

Glendower Aircraft Co., Ltd., 54, Sussex Place, South Kensington, S.W.7. "Glenacelle, Southkens, London." Kensington 7005 (3 lines).

Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Graham-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 129.

London Office, 12, Regent Street, S.W.1. Regent 2084.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydroplid, Crickle, London." Hampstead 7320.

Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St. James, London." Regent 912.

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 282 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet, "Martinsyde, Weybridge." Weybridge 544; Byfleet 171.

National Aircraft Manufacturing Co., Ltd., 15, Drummond Crescent, Seymour Street, Euston. Museum 3373.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscont, Crickle, London." Willesden 2455.

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

The Regent Carriage Co., Ltd., 130-132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 1088 (8 lines).

Standard Aircraft Manufacturing Co., 28, Bow Common Lane, E. East 2823.

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin." Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet." Byfleet 3, 2 & 3.

Thames Aviation Works, Ltd., Curtain Rd., E.C.2. London Wall 6766.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyta, Knights, London." Kensington 6840.

Waring & Gillow, Ltd., Hammersmith, "Warisen, Phx, London." Museum 6666.

Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 5.

Aeroplane Manufacturers (continued)—

Whitehead Aircraft (1917), Ltd., Richmond, Surrey. "Whitecraft, Richmond, Surrey." Richmond 1760-1.

Witton & Witton, 143, Fonthill Road, Finsbury Park, London, N.4. North 2110.

Airships—

Airships, Ltd., High Street, Merton. Wimbledon 1334.

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 378.

C. G. Spencer and Sons, Ltd. (See under "Balloons.")

The Willows Aircraft Co., Ltd., Cardiff. "Aircraft, Cardiff." Cardiff 300 (main line).

Aluminium Castings (Sand and Die)

Coan, R. W., 219, Goswell Road, London, E.C.1. "Krankases, Isline, London." City 8846.

The Sunbeam Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Sunbeam, Kingston-on-Thames." Kingston 1154.

Balloons—

C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronant, London."

Bent Timber Parts—

Dalston 1893.

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Euspuare, London." Museum 446.

Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Bearings (Etonia Cast Phosphor Bronze)

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds."

Blinds—

Central 1027.

J. Avery & Co., St. Gt. Portland Street, London, W. "Velarium, London." Gerrard 6820.

Blowpipes (Oxy-Acetylene)—

Acetylene Corporation of Great Britain, Ltd., The, 29, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic. 3540 (3 lines).

Bolts—

Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16. Dalston 2300 (2 lines).

Books (Aero Engines)—

Dykes' Auto Encyclopedia, Gallam, 149, Strand, W.C.2.

Buildings—

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Rubery, Owen & Co., Darlaston, South Staffs.

Cable Coverings and Cable Controls—

The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green." Acock's Green 1091 & 1094.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London."

Willesden 2400 (3 lines).

Herbert Terry & Sons, Ltd., Redditch "Springs, Redditch." Redditch 61.

Carburettors—

Holson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.1. Victoria 4670.

Casein—

T. M. Duché & Sons, 6, Eastcheap "Duché, London." Avenue 2006.

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Surieden, Fen, London." Avenue 34 and 35.

Celluloid (Non-Flam.)—

Greenhill & Sons, 5, Water Lane, E.C. "Greenberg, London." Central 13067.

Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.

Dunhill's, Ltd., Euston Road, N.W.1. "Dunscend, London." North 3403-6.

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., 61 Eastern St., E.C.1.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, 'Phone, London." Hampstead 3103 & 3424.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond. "Acros, Richmond." Richmond 368.

The Sunbeam Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Sunbeam, Kingston-on-Thames." Kingston 1154.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. "And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafrec, Piccy, London." Gerrard 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellulate, London." Regent 4040.

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 289.

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawk, Reg, London." Gerrard 440.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford. "Plumy, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Beardmore Aero-Engine, Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 338.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd. (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1010.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrific, London." Gerrard 6626.

Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1. "Rolhead, London." Gerrard 1054-5-6.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 085.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elvenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames." Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1680.

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 300, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 681.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynadite, 'Phone, London." Willesden 2480.

Electric Cables—

E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 248.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W. "Installing, Eusroad, London." Museum 70.

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-147, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Fluxes—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.



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Flying Boat Builders—

Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Flying School—

The L. & P. Aviation Co., Stag Lane Aerodrome, Edgware. "Kingsbury 102. Avenue 995, 996, and 7996.

Furniture (Office)—

Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6170.

Galvanising—

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—

J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.

Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

Glue—

Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Beccecofin, Cannon, London." City 1206.

Improved Liquid Glues Co., Ltd., 61, Hermitage Street, E. (Croid.) "Exceroiden, 'Phone, London." Avenue 4011-2.

Mendine Co., 8, Arthur Street, E.C. Bank 5873.

Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Hack Saw Blades and Machines—

Victor Saw Works, Ltd., 2 and 3, West Street, Finsbury Circus, London, E.C. "Vicsaw, 'Phone, London." London Wall 1880.

Heating and Ventilating—

Chas. P. Kinnell and Co., Ltd., 65 & 66a, Southwark Street, London, S.E.1. "Kinnell, London." Hop 572 (2 lines).

The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 765.

Hollow Spars—

McGruer Hollow Spar Co., Ltd., Commercial Road, Lambeth, S.E. "Ollospash, Watloo, London." Hop 718.

Instruments—

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, 'Phone, London." Walthamstow 180.

Leather for Aeroplanes—

George Angus & Co., Ltd., Newcastle-on-Tyne. City 74. Central 0907. Quayside City 74.

Leather Cloth—

New Pegamoid, Ltd., 134, Queen Victoria Street, London. "Pegamoid, Cent, London." City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—

W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines.)

Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, 'Phone, London."

The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asteroidal, Coventry." Coventry 278.

The M.L. Magneto Syndicate, Ltd., Coventry. "Corlton, Coventry." Coventry 1008-1009.

Metal Casement Manufacturers—

Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 5909 (2 lines).

Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 4243. Avenue 1432.

Metals in General—

Samuel Mercer & Co., 168, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 995, 996, & 7996.

Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Aircraft Supplies Co., Ltd., Ascot House, 128, Long Acre, W.C.2. "Upcast, Rand, London." Gerrard 276 (2 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.

Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. "Bolts and Nuts." Bayliss, Wolverhampton." Wolverhampton 1041.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., 61 Eastern St., E.C.1.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

Rubery, Owen & Co., Darlaston, South Staffs.

Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 666.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn; London, W.C.1. "Pulvipult, Phone, London." Holborn 410.

The Sunbeam Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Sunbeam, Kingston-on-Thames." Kingston 1154.

The Selsdon Aero & Engineering Co., Ltd., 15, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynadite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—

Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 415.

Rubery, Owen & Co., Darlaston, South Staffs.

Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 3013-4934-1915.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethrood, London." London Wall 6400.

Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham." Central 793.

MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow. Tapes, Cords, and Threads. City 3115.

Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 270/281, Euston Road, London, N.W.1. "Manegecor, Eusroad, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 630 (4 lines).

Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—

C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London." Central 11305 & 13496.

Parachutes—

E. E. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3366-3367.

C. G. Spencer & Sons, Ltd. (See under "Balloons.")

Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149.

Presswork—

Rubery, Owen & Co., Darlaston, South Staffs.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Propellers (continued)—

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd., "Avipro, Hyde, London." Hendon 9. Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 282 (4 lines).

Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.

The Pegasus Aircraft Co., Ltd., Tetterdown Street, Tooting, S.W.17. Streatham 1242.

Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—

The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 76.

Radiators—

Gallay Radiator Co., Ltd., 198, Great Portland Street, W.1. "Galyradico, Wesdo, London." Mayfair 4826.

John Marston, Ltd., Sunbeamland, Wolverhampton. "Sunbeam, Wolverhampton." Wolverhampton 40 and 266.

Rawhide Hammers—

Ira Stephens, Whitelands Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—

Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 366.

Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 265, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 & 3812.

Safety Belts—

C. H. Holmes & Son, 58, Albert Street, Manchester. "Semloh, Manchester." City 4432.

Screwing Die Heads—

Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 282 (4 lines).

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

Short Bros., Rochester & Sheerness, Rochester. "Seaplanes, Chatham 627.

Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights

Brown Bros., Ltd., Great Eastern St., E.C.1.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." 3540 (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynadite, 'Phone, London." Willesden 2480.

Shackles—

British Gold Shell Ring Co., Ltd., Hounslow, Middlesex. "Golshel, Hounslow." Hounslow 254.

Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Rubery, Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—

The Acetylene Corporation of Great Britain, Ltd., 29, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830.

British Metal (Kingston), Ltd., Kingston-on-Thames. (Staffs.)

Rubery, Owen & Co., Darlaston, South Staffs.

The Selsdon Aero & Engineering Co., Ltd., 15, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

The Sunbeam Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Sunbeam, Kingston-on-Thames." Kingston 1154.

"The Aeroplane" Buyers' Guide.—*continued.*

Solder Manufacturers—
Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Sparking Plugs—
Brown Bros., Ltd., Great Eastern St., E.C.1 Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Robinhood Engineering Works, Ltd., Newlands, Putney Vale, S.W.15. Makers of KLG Plugs. "Kaelgec, Phone, London." Putney 2132-3.

Springs—
Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

Steel—
Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield." Central 4522-3-4.

Steel Stamps and Markings—
John Meerloo & Sons, Cleveland Street, Mile End, E.1. "Dayhur, Phone, London." East 3331 (2 lines).

Steel Tubes for Aeroplanes—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Tapes and Smallwares—
MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 1115.

Timber—
Brown, R. F. & F. W., Wollaton, near Nottingham. Nottingham 1526.
Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Euston, London." Museum 496.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Time Recorders—
Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—
Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349.

Turnbuckles—
Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery Owen & Co., Darlaston, South Staffs.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston." Museum 70 (4 lines).

Tyres and Wheels—
The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—
Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Varnishes—
The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjan, Phone, London." Mayfair 6347 (3 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harlan 1, Wimbledon 45." Wimbledon 45 and 1305.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Watchmakers and Jewellers—
(Silver Models)—
Goldsmiths' & Silversmiths' Co., Ltd., 112, Regent Street, W.1. Gerrard 9091 (3 lines).

Welding and Cutting Plant—
Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Welding Repairs—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac," Phone, London." Victoria 3540 (3 lines).

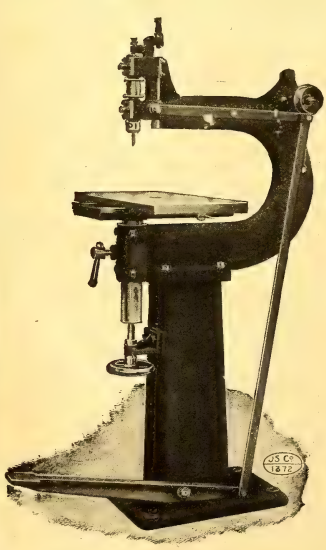
Wind Shields—
Auster, Ltd., 153, Long Acre, W.C. "Windflector, London." Regent 5910.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Wire Gauze—
Greening, N., & Sons, Ltd., 16, Finsbury Street, London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.

Wire and Cables—
Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

Wirework—
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Woodworking Machinery—
Robinson, Thomas, & Son, Ltd., Rochdale, "Robinson, Rochdale." Rochdale 467.
Sagar, J., & Co., Ltd., Halifax "Sawtooth," Halifax." Halifax 136.
Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.



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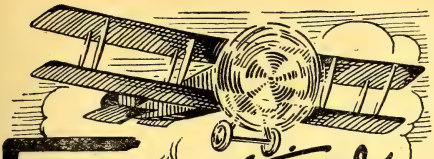
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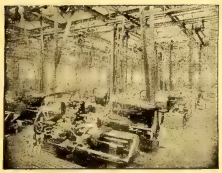
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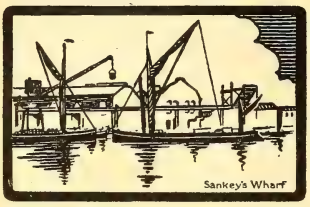
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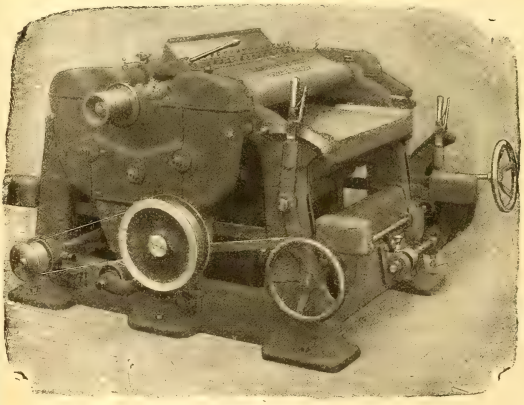
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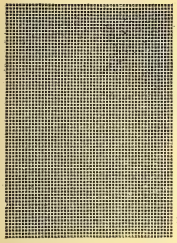
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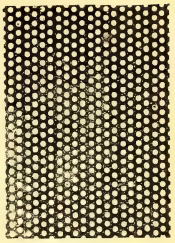
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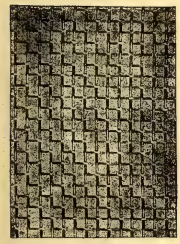
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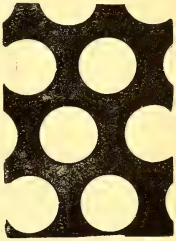
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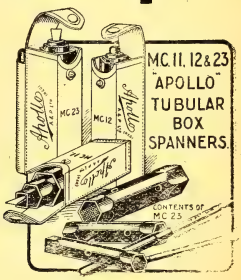
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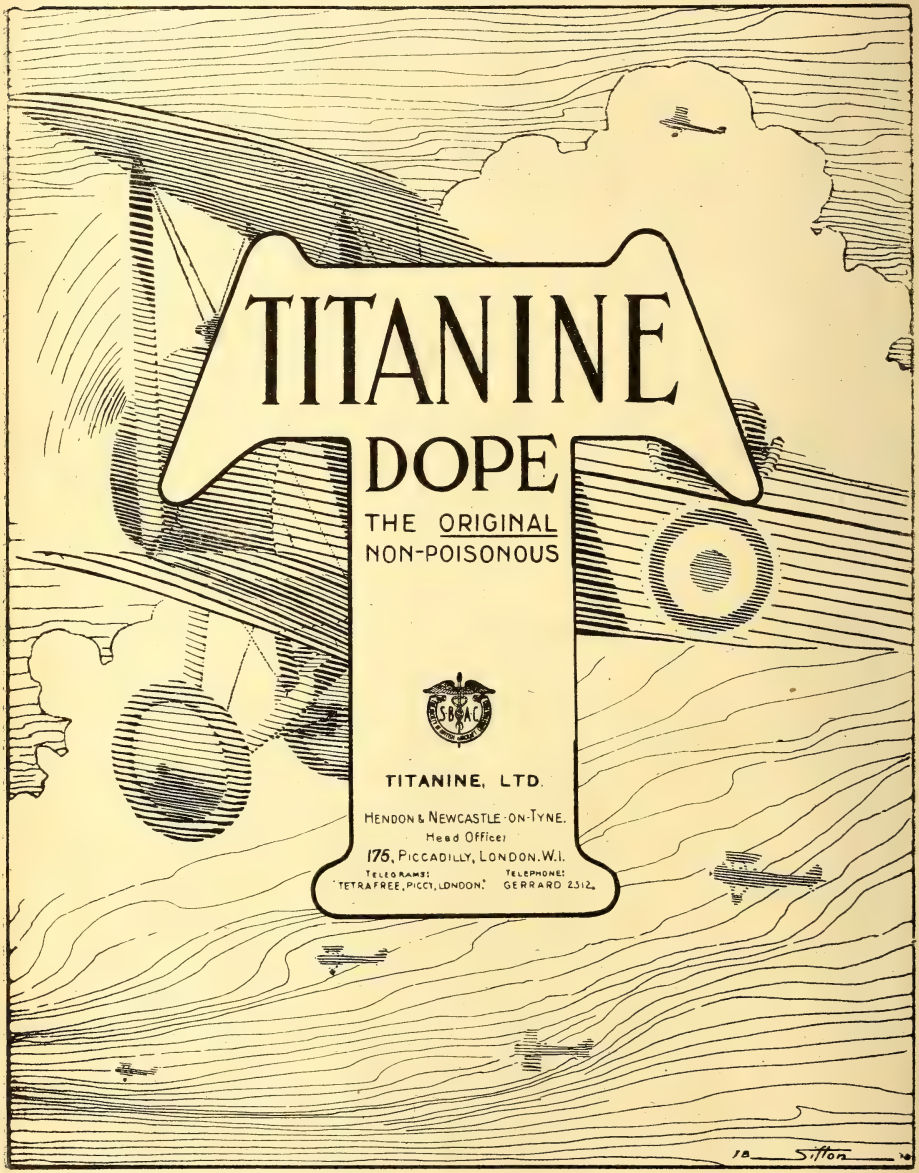
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Thickness of combustion chamber wall	13/64 in.
Thickness of cylinder barrel, above flange at water jacket	3/16 in.
Thickness of cylinder barrel, above flange below water jacket	7/32 in.

PISTONS.

Length	4 1/16 in.
Length to diameter ratio	0.938 : 1
Width of rings	1/8 in.
Distance from bottom to centre of gudgeon pin	2 1/6 in.
Thickness of head at centre	1/4 in.
Thickness of head at edge	3/8 in.
Thickness of wall at bottom	1/8 in.

GUDGEON PIN.

Diameter of gudgeon pin	1 5/64 in.
Thickness of wall	0.164

CONNECTING ROD.

Length between centres	10 7/16 in.
Ratio length to crank throw	3.313 :1
Width	5/8 in.

CRANKSHAFT.

Number of crankshafts	2
Number of bearings (Plain) per crankshaft	9
Number of bearings (Ball) per crankshaft	1
Cylinder centres (in block)	4 17/32 in.
Cylinder centres (between blocks)	7 15/32 in.
Crank pins, outside diameter	2 3/16 in.
Inside diameter	1 1/8 in.
Length	2 11/64 in.
Main Bearings.	
Outside diameter Nos. 1, 2, 3, 4, 6, 7, 8, 9	2 3/16 in.
Outside diameter No. 5	2 5/8 in.
Inside diameter, Nos. 1, 2, 3, 4, 6, 7, 8, 9	1 1/8 in.
Length, Nos. 1, 2, 3, 4, 6, 7, 8 Bearing Bushings	1 9/16 in.
Length No. 9 Bearing Bushing	2 19/32 in.
Length No. 5 Bearing Bushing	1 31/32 in.
Ball Bearing	Hess-Bright Monarch No. 6211
Crank Webs:	
Width	3 17/32 in.
Thickness	43/64 in.
Radius of fillets	3/32 in.
Weight of one complete shaft, for 8 cylinders, with propeller drive gear bolts and nuts, bevel gear and oil passage shells	96½ lbs.

CAMSHAFT.

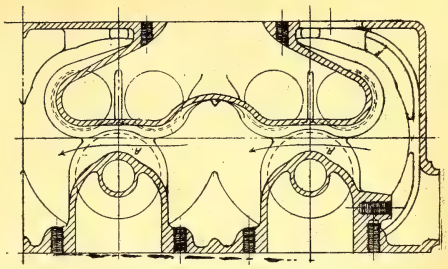
Diameter of shaft	1 in.
Inside diameter	11/16 in.
Number of bearings	10
Number of cams per cylinder	3

CAMSHAFT BEVEL GEAR.

Pitch diameter	3 3/4 in.
Number of teeth	30
Pitch	8
Width of face	3/4 in.

CAMSHAFT DRIVING SHAFT.

Diameter	3/4 in.
Wall thickness	1/8 in.



Section through cylinder head, showing valve ports.

CRANKCASE UPPER HALF.

Material	Aluminium
Thickness of wall	3/16 to 5/16 in.
Thickness of supporting flange	3/8 to 7/16 in.
Centre distance of support bolts	24 3/4 in.
Number of support bolts	12
Diameter of support bolts	3/8 in.
Centre to centre of crankshafts	10 1/4 in.
Height of case	9.055 in.

CRANKCASE LOWER HALF.

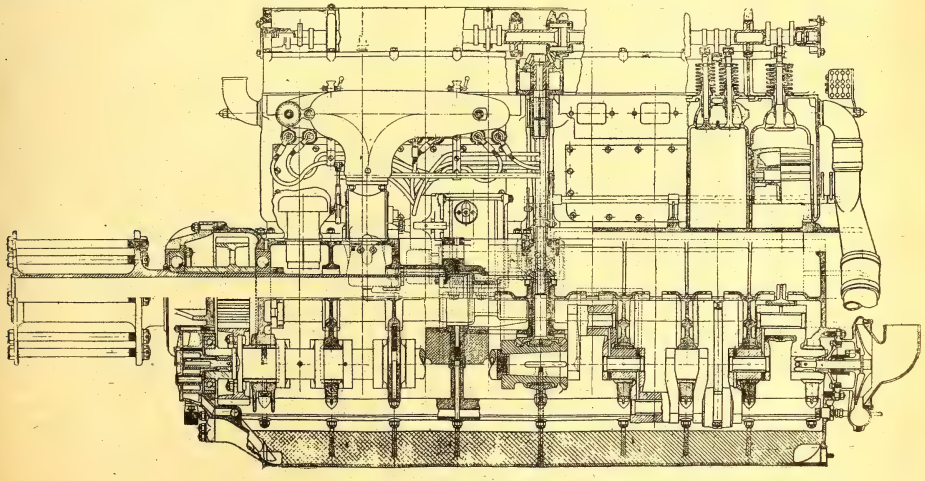
Material	Aluminium
Thickness of wall	3/16 in.

IGNITION.

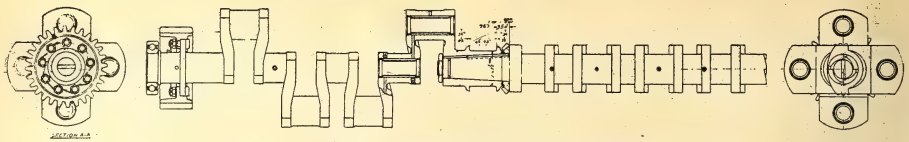
Type	Magneto
Number	4
Make	"Dixie 800"
Firing order	1L, 7R, 5L, 4R, 3L, 8R, 7L, 2R, 4L, 6R, 8L, 1R, 2L, 5R, 6L, 3R
Advance	38 deg.

REDUCTION GEARS.

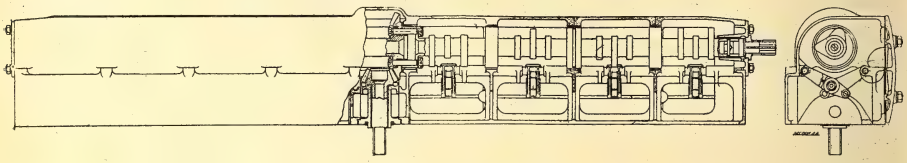
Crankshaft airscrew drive gear:	
Pitch diameter	5.6 in.
Pitch	5
Number of teeth	28
Width face	2 3/8 in.
Diameter bolt circle	3 17/32 in.
Number of bolts	9
Diameter of bolts	7/16 in.
Airscrew shaft gear:	
Pitch diameter	8.4 in.
Pitch	5
Number of teeth	42
Width face	2 3/8 in.
Number of splines	8
Width of splines	0.405
Height of splines	0.094



Longitudinal Section, the American Bugatti.



Crankshaft assembled, 410-h.p. American Bugatti.



Camshaft and Casing Assembly.

PROPELLER SHAFT.

Number of bearings	3
Type of bearings	Two ball, one plain
Plain bearing	Bronze babbitt lined
Outside diameter at gear (over splines)	3 3/4 in.
Outside diameter at rear end	3 5/16 in.
Outside diameter at propeller	3 31/64 in.
Inside diameter	2 61/64 in
Diameter airscrew flange	9 3/4 in.
Diameter of bolt circle	7 7/8 in.
Diameter of bolts	5/8 in.
Number of bolts	8

The following further details have been extracted from the same source:—

CYLINDERS.

The cylinders are of cast iron in blocks of four. The water jackets are integral with the cylinder blocks, but open on each side below the inlet and exhaust ports. These openings are covered by screwed-on aluminium plates.

Three vertical valves (according to the source of information, two outlet and one exhaust) are used per cylinder. The relative positions of these valves are shown in a figure, from which it is seen that each of the large exhaust valves is provided with a separate port, and that the four inlet valves of each pair of cylinders have a common inlet port.

All valve stems and seatings are amply water-jacketed.

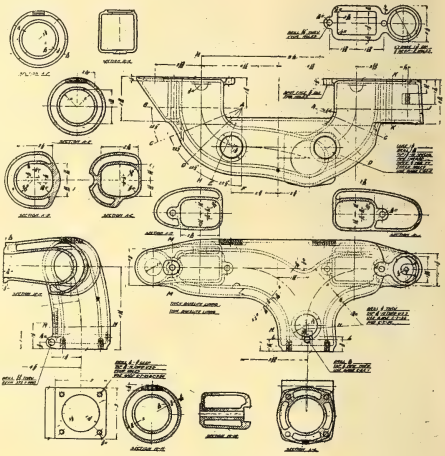
Two ignition plug sockets are fitted to each cylinder in the side of the combustion chamber on the inlet side.

VALVE GEAR.

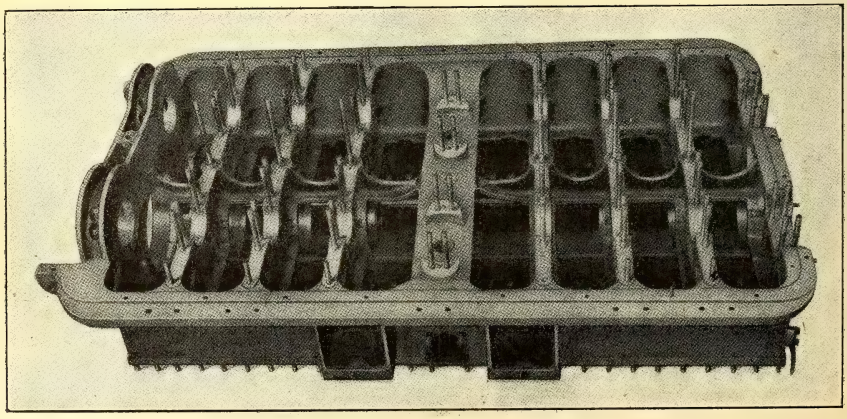
The valves are driven through rocking levers by overhead camshafts, one centrally over each row of cylinders.

Actually there are four separate shafts, one for each block of four cylinders, but the pair of camshafts for each line of cylinders are coupled together between the two cylinder blocks.

At this coupling a bevel wheel is attached, which engages with a gear at the head of a vertical shaft, which is in turn driven from the centre of the crankshaft.



Inlet Manifold Details.



Upper half of crankcase, American Bugatti Engine.



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Each camshaft with its gear and the attendant rocking levers is carried in a cast aluminium housing, which completely encloses the valve gearing.

Pistons.

These are aluminium castings, with cut-away skirts, as shown in an accompanying figure. This also shows the original Bugatti piston, which has been departed from widely in redesigning.

According to the letterpress, the gudgeon-pins are free to turn in both the pistons and the connecting rod ends. This does not agree with the stress laid on the ease of inserting the locking wire into the gudgeon-pin securing set-pins in the figure.

Connecting Rods.

The connecting rods are steel forgings of I section, machined all over. The small ends have bronze bushes pressed in. The big ends are bronze-bushed and white metal lined.

Crankshafts.

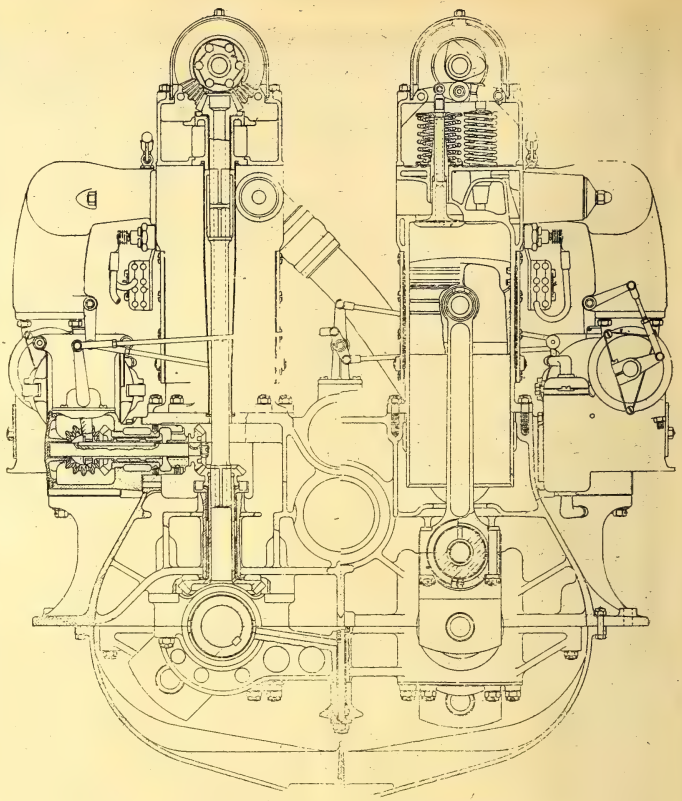
As has already been stated, each of the two crankshafts is made in two pieces coupled together.

The junction is a fine taper cone, keyed and held tight by a nut on the small end. At this junction is a bevel wheel which drives a vertical shaft from which the magnetos and the camshaft of that line of cylinders are both driven.

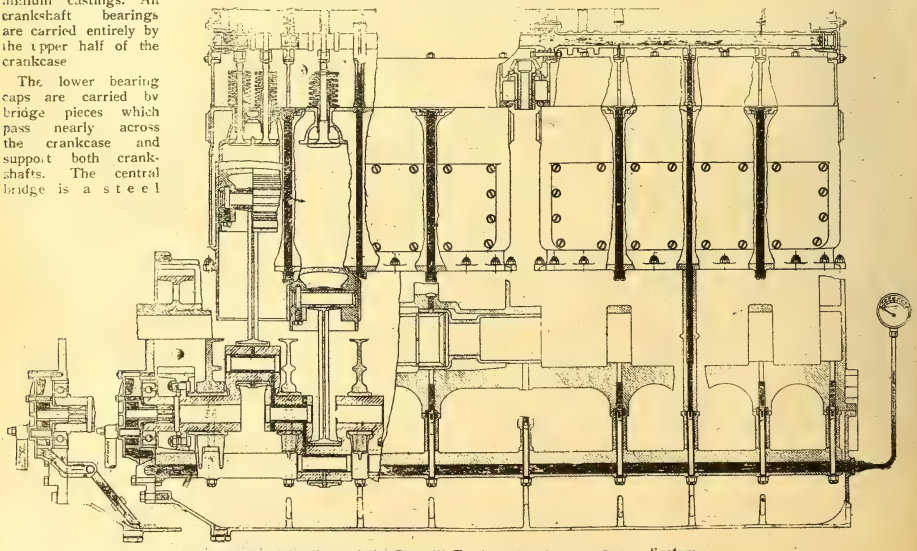
Crankcase.

Both upper and lower halves are aluminium castings. All crankshaft bearings are carried entirely by the upper half of the crankcase

The lower bearing caps are carried by bridge pieces which pass nearly across the crankcase and support both crankshafts. The central bridge is a steel



Sectional End View American Bugatti Engine.



Longitudinal Section of the Bugatti Engine, showing the Oiling System.



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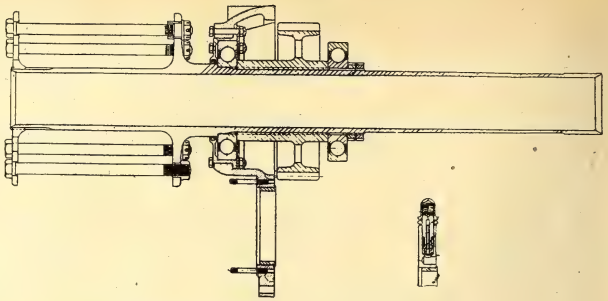
forging, as the bearings at this point are arranged to take any end thrust which may come on the crankshafts. All the other crankshaft bearings have end play, and the corresponding bridge pieces are aluminium castings.

All the main bearings are plain, bronze-bushed and white metal lined, but at the airscrew end of each shaft, beyond the pinion for the airscrew drive one ball-race journal is used.

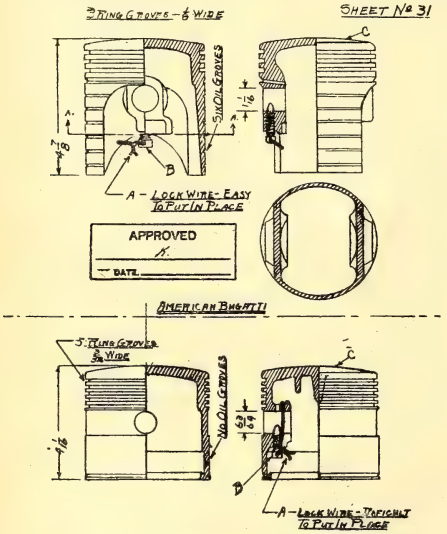
The Airscrew Shaft.

This is a steel forging, with one airscrew hub flange solid with the shaft.

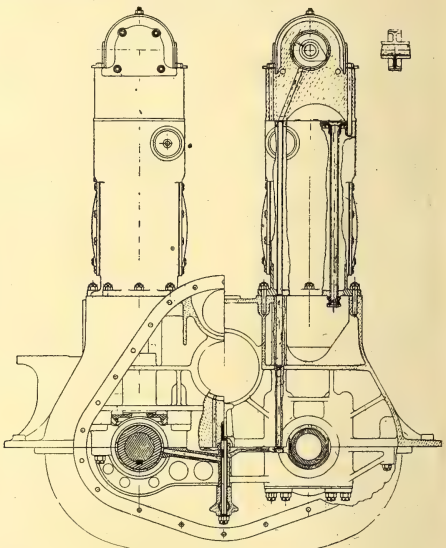
This shaft is bored out to a sufficient diameter to permit of firing a 37 m/m. Q.F. gun through it, and a clear passage through the crankcase in line with it is provided for the same purpose.



Airscrew Shaft of the American Bugatti Engine.



The Pistons of the American—(Top) and of the French (Bottom) —Bugatti Engine.



Cross-section showing Oiling System of the American Bugatti.

The spur wheel through which the shaft is driven from the crankshafts is carried by 9 bolts passing through a flange on the shaft.

Deep grooved ball-races support the shaft on each side of the spur wheel, and these races take the whole of the airscrew thrust.

Ignition.

Four magnetos, each firing eight cylinders, are fitted. Two are placed on each side of the engine between the carburetters, with their shafts parallel to the crankshafts. Upon the vertical shaft driving the camshaft a bevel wheel is mounted inside the crankcase, and this drives a horizontal shaft at right angles to the crankshaft, passing out through the side of the crankcase. At its outer end this shaft carries another bevel wheel which drives the two magnetos on its own side of the engine. The magnetos appear to be fitted with an advance and retard mechanism of the spiral coupling type, which secures maximum spark intensity at all magneto timings.

Lubrication.

The oiling system is arranged on the dry sump system, with one pressure and one scavenging oil pump. One of these pumps is driven from the airscrew end of each crankshaft.

Oil from the oil tank is forced by the pressure pump along an oilway in the centre of the crankcase. This oilway appears to be a separate aluminium casting secured by studs to the under side of the bridge pieces "carrying" the crankshaft-bearing caps. These studs are reduced in diameter to less than the bore of the holes through which they pass, and thus an annular oil passage is provided to each bridge piece. Oilways are bored from each bearing-cup through the bridge piece to the passage so left.

Holes in the crankshaft register with the oil-hole in the bearings twice in each revolution, and oil is fed through these and the hollow crankshaft to the crank-pin.

From the oilways to the crankshafts, a series of vertical oilways, the upper parts of which are copper tubes passing through the water-jacket space, lead to the camshaft housing, and to one bearing in each half of each camshaft. At each of these bearings oil is admitted to the interior of the camshaft and led along to the remaining bearings.

Vertical drains through the water-jacket space return the used oil to the crankcase.

Used oil in the crankcase is removed and returned to the oil tank by the scavenger pump.

Both oil-pumps are of the usual spur-wheel type, and differ only in that the scavenger pump has a greater width of tooth face.

Carburation.

A separate carburetter is provided for each block of four cylinders. Gas is led to the inlet ports through water-jacketed manifolds, of which a figure is given.

The carburetters are of the Miller, multijet type and are illustrated in section.

So far as can be ascertained, of the features described above, only the lubrication system and the type of carburetter employed are confined to the American engine.

The modifications from the original model are otherwise solely to points of detail design, the most important probably being an alteration to the cylinder head, providing freer water circulation, better valve cooling, and a slight increase in the distance between valve centres.

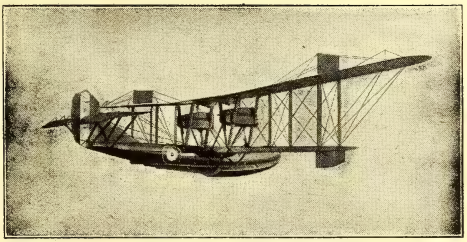
The original engine was fitted with an overhung airscrew shaft, with bearings inside the spur gear only, and the adoption of bearings on both sides of the gear should undoubtedly improve the engine.

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Last month		74 10s. od.
Lowest price, 1918		100 0s. od.

TIN.—There has not been much activity recently and the market is in a rather unsettled condition. Consumers continue to buy hand to mouth, and this is not only due to the present unrest prevailing here, but is also probably due to the opinion that prices cannot be maintained at their present inflated level. The recent report to the effect that the F.M.S. Government intended fixing a minimum price of £242 on the Tin they hold has not been officially confirmed. Another rumour has just been circulated to the effect that when the blockade is lifted Germany will be supplied with Tin out of the stocks of Straits Tin held in the East. If this is so, the available world's stocks will be reduced; at the same time these rumours should be received with caution. Their only object may be to try to stir up buying interest.

Comparative Prices.

		Per Ton.
Standard.	To-day, March 26th...	£240 10s. od.
Last week		237 5s. od.
Last month		210 15s. od.
Lowest price, 1918		240 0s. od.

LEAD.—Although there is an apparent tendency on the part of buyers to cover their requirements, the present price is considered unreasonable, and the stocks held by the Government are viewed with much apprehension, and the Labour unrest has also created a certain amount of nervousness. The price at present is £27 10s. average.

STEEL.—At the time of writing the labour situation is not definitely settled, and this continues to affect the demand. It looks as though there will not be any stocks, but it is not quite certain whether there will be a further advance in the price of coal, and if there is, it is not likely to be as large as was generally expected. There is hardly any demand for Aircraft Steels or H.S. Steel.

The question of price is also very unsettled; in fact, certain makers refuse to quote a definite price for delivery after April 30th, 1919. The demand for certain industries is fairly good.

TIMBER.—The position of the Timber market is very uncertain. In the first place, the Government hold huge stocks of all kinds of wood, and, although the Controller has stated that this material would be disposed of at the current market price on the date of sale, this statement does not help matters very much. This is one of the factors which are causing a certain amount of uncertainty. The other factors which enter into the matter are the uncertainty in prices and labour. There has been a fairly good demand for Mahogany, and buyers are not scarce.

The Plywood position is creating a great deal of interest, and it is not yet clear what the Air Ministry intend doing with the huge stocks which they hold.

The question was recently raised in the House on March 13th by Sir Herbert Neill, when he asked the Chancellor of the Exchequer if he will state who is responsible for the regulations considered to be necessary for the realisation of the stocks of aeronautical Plywood in this country at the date of the armistice or contracted to be purchased by His Majesty's Government at that time; whether he will cause inquiries to be made of the S.M. 7 Department (Aircraft Supplies) as to whether any and what offers were received by that Department for the purchase of the entire stock referred to; whether, on January 28th last, a firm offer extending over three weeks was received at 47s. 6d. per 100 square feet for the purchase of such entire stock; if he will state whether, on the intervention of the Timber Controller, or that of some other, and which, Controller, the provisional arrangements made by the S.M. 7 Department (Aircraft Supplies) to accept the offer above referred to were overruled; if he will state whether 2,500,000 square feet were placed by the Timber Controller with Foy, Morgan and Co., timber brokers, for disposal; whether Foy, Morgan and Co., in the absence of any adequate accommodation for the storage of the Plywood at Liverpool, stacked the same in open sheds, and that, consequent on weather conditions, the value has deteriorated; and if he will likewise state the amount of loss occasioned to the Treasury consequent upon the cancelling of the provisional order previously referred to?

Mr. Bridgeman: I have been asked to take this question. The Ministry of Munitions is responsible for regulating the disposal of surplus aeronautical Plywood, which is being carried out under the Timber Controller, who is also Controller of Surplus Timber Disposal under the Surplus Government Property Disposal Board. Certain offers were received for the purchase of the entire stock referred to, including an offer in the terms mentioned in the question, but no provisional arrangements were made by S.M. 7 Section of the Aircraft Production Department to accept that or any other offer. With regard to that offer, the Timber Controller was consulted, and, as the price offered was less than half the c.i.f. cost to United Kingdom port, he considered that it would be unwise to accept the offer before asking other manufacturers and dealers to tender for the Plywood. The Aircraft Production Department agreed, and the offer was refused. Considerable quantities of Plywood have been placed with Foy, Morgan and Co. as brokers, and have been stored in Liverpool and London. A representative who has just returned from Liverpool states that the goods have been properly stored in dry warehouses, and have not deteriorated in any way. No loss has resulted from the refusal of the offer referred to. I may add that it has been decided that publicity should be given in every case as to the disposal of surplus Government Timber, and that, where possible, sales should be by public auction or public tender.

Generally speaking, consumers are holding their hands, and will not enter the market until the position becomes more stable.

LOVE STORIES ON AEROPLANE CONTROLS

Aircraft manufacturers owe much to inventors, who, years ago, turned their attention to the improvement of the pedal cycle. Many of the problems of combining strength with lightness had been solved when aeroplanes only existed in the imaginations of writers of fiction. Twenty-one years ago Bowden Wire was first introduced for actuating brakes on cycles; to-day this useful method of controlling mechanism is in use in every type of aircraft. Quite recently Bowden Wire, Ltd., invited the Press to a view of their new works at Willesden. The building was erected between June and December, 1915, to provide accommodation for the new plant that was necessary to cope with the enormous demand for Bowden Wire caused by the war. It was required by all the Allies in ever-increasing quantities. The new buildings now cover two acres, and are splendidly equipped.

It is an interesting experience to watch the process of manufacture. Here are machines winding the wire into the familiar spiral casing, elsewhere others consisting of bobbins jazz dancing at dazzling speed as they knit a cotton covering over the bright metal. Other machines coat the cotton with a black waterproof material made in witches' cauldrons, the black depths of which are somewhat shuddersome, and the aroma reminiscent of German gas attacks.

The base of this waterproof coating is celluloid obtained from old cinema films, of which countless hundreds of miles are stored in a fireproof building. A misogynist member of the staff was once in charge of this mortuary of films that had lived their limeless lives. He was found one slack day looking through spool after spool with an expression of fathomless depression. One of the managers asked if he had found anything interesting. The answer, given with deep disgust, was:—

"No—usual sloppy love."

Strange that the "sloppy love" films that were the delight of flappers should have been used to cover wires that controlled the aeroplanes which fought on all the Fronts through the war!

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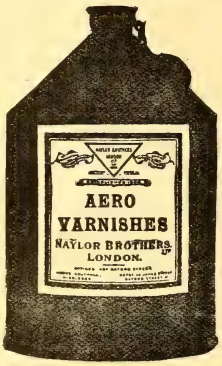
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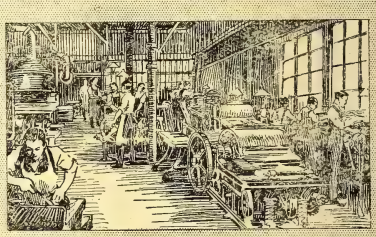
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COMMERCIAL AERONAUTICS & CIVIL AERIAL TRANSPORT

STUNTS OR BUSINESS?

By "Medway."

If we are to believe everything that appears in the papers, North America is at present principally inhabited by people who are firmly determined to make the first successful Atlantic flight. Crowds of private speculators anxious for fame or notoriety stand cheek by jowl with the representatives of Government organisations, equally anxious to "get in or get over." Uppermost in all minds is the desire to do it first, and so score off others of similar aspiration.

Public Interest in the Atlantic Flight.

Now I suggest with all modesty that the thing is being overdone. We know perfectly well that it is possible for an aeroplane to fly the distance. Unless we depend on a complex organisation, success or failure is more a matter of luck than anything else. The public interest is much the same as that of a crowd that goes to watch the lion-tamer, rather hoping that the lion may prove to have been insufficiently tamed. It is a dull business if the first attempt proves successful. One series of glaring headlines, and the whole thing is over. The only result is that the world discovers something which it knew already—namely, that an Atlantic flight is possible.

The bulk of the interest focusses on the fact that it is also dangerous, and will remain so until a perfect organisation has been created. I cannot imagine business men financing a regular Trans-Atlantic service by aeroplane for some time to come. If there was ever a job for the airship as against the aeroplane, surely this is it. Personally, I class the Trans-Atlantic aeroplane flight with the escapades of people who go over the Niagara Falls in barrels, or do tight-rope performances across the top. A serious attempt certainly means personal courage of a rather foolhardy character. A few failures would do an immense amount of damage to commercial aeronautics for years to come. Success could not lead to the establishment of any regular safe service at an early date.

There are evidently two ways of tackling the stunt. One is that of the individual who gets a good machine, tunes it up until he believes it to be perfectly reliable, and then trusts to luck.

The other method is what may be called the departmental one. Thus we are told that the United States Navy is organising an attempt. Now, if we put the whole naval resources of a great nation behind a venture of this kind, and if we prove successful, then the pilot who brings the trip off is certainly not the sole claimant to any honour accruing from the success.

"Ground" Organisation.

We simply get back to the old fact that long-distance aeroplane journeys are more dependent on what is commonly called ground organisation than on anything else. We might string out all the ships of the British Navy and the British Mercantile Marine at short intervals across the Atlantic, and then we could choose a fine day and start upon a flight. If anything went wrong, the aeroplane—it would, in fact, presumably be a flying boat—could flop into the water somewhere near a ship, and the occupants could be got on board. If we were determined to bring off the stunt, we should provide not one but ten or twenty large flying boats, which might start at the same time or at short intervals. Many, perhaps the majority of them, would fail to reach the other side, but the odds are that somebody would get across. The others would run little or no more risk than is encountered on a long overland journey upon a route properly provided with landing stations.

As I have already said, all we should know after the stunt would be what we know already—namely, that the thing is mechanically possible. I take it that no one would advocate going to the extremes advocated above, and holding up the greater part of the ocean trade of the world for a few days so as to provide an almost continuous system of landing stations. Presumably, the United States Navy would propose to do the same thing on a smaller scale. The smaller the number of vessels used as lightships or refuges, the greater the risk to the occupants of the aeroplane. The private individual with no organised assistance runs the greatest risk of all.

Notoriety and Personal Gain.

It is no affair of the business community if a certain number of men like to take big personal risks of any kind. The instinct which makes men keen on climbing the aeroplane—it would, in fact, presumably be a flying same place safely by another road, makes them also enjoy personal danger of other kinds. There are a great many feats which, though we may admire in the individual, we must recognise as not business from the point of view of the community. To the individual they may be quite good business. Success means personal notoriety, and notoriety may mean big financial gain.

I have no quarrel with people who like the idea of flying the Atlantic, but I feel that some protest is needed against any silly contention to the effect that a NATION can in any way improve its reputation by doing it first. The time and thought which must be given to creating an organisation sufficiently complete to absolve a nation from the charge of having wilfully risked the lives of valuable citizens means a great deal of good value wasted. The organising brain needed would be much better applied to the scheming of routes along which regular services can reasonably be operated on a sound business basis in the near future.

There are some things which must be done in order to prove that they can be done. This is not one of them. We could prove the possibility of flying the Atlantic quite easily without doing it, if any such proof were needed. We know the distance, and that same distance could be flown by journeying a certain number of times—say, from London to Paris and back without stopping.

Airships as Trans-Atlantic Mail Packets.

It has been suggested that for many years to come the aerial journey between Europe and America will be performed by large airships, aeroplanes being merely used as tenders to bring passengers to the point of departure and to convey them from the point of arrival to their destinations.

If we realise that this is the proper method, why should we waste valuable time in trying to do something which we know to be inherently unsound as a practical proposition? If we want to demonstrate the fact that a motor-lorry is a useful thing for carrying goods along roads, we need not ask it to make good its case by crossing the Sahara. If we want to prove that a bicycle is a useful and cheap means of locomotion, there is no need to hire a tramp cyclist to detach the handle-bars and the pedals while sitting on the back wheel, and to perform other music-hall tricks of the kind. We know fairly well what are the legitimate spheres of the aeroplane and the airship in the form in which they are found at present, and will be found in the near future. We do not have to prove the case of either of them by making it do the other one's job.

I dare say some of my readers, if any of them have got so far, will accuse me of being altogether lacking in enterprise and ambition. My point is, however, that I want to see commercial aeronautics recognised by the public as being a means of travel not abnormally dangerous or experimental. The organisation of big experiments is likely to give exactly the opposite impression, and therefore I think it should be depreciated, and that we should leave fancy exhibitions to individuals who, for their own private reasons, are prepared to risk their lives on the off-chance of bringing off a big publicity stunt.

POST-BELLUM POLICIES.

By The Special Commissioner of "The Aeroplane."

MR. OSWALD SHORT.

I got a preliminary idea of Messrs. Shorts' visions of the future when I saw their works at Rochester, more particularly the big seaplane shed still to be finished.

Here certainly there is no indication of arrangements for decreased output, and it gave me quite an optimistic feeling in spite of my being very cold after a run down in a car.

Mr. Oswald Short tells me that he is going to build various types, but at present does not intend to construct anything gigantic in the way of land machines, though he has arrangements for a six-passenger machine completed.

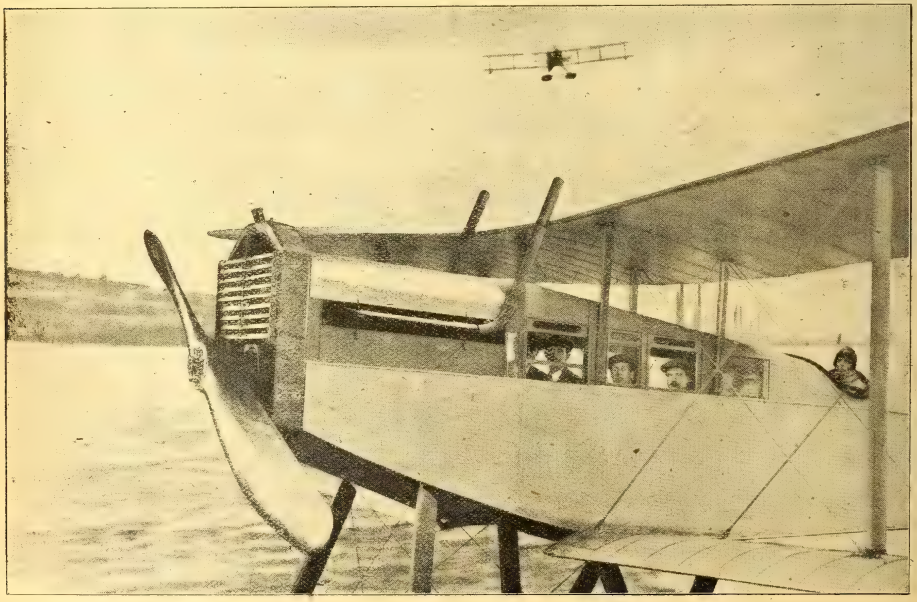
As might be expected by anyone who has followed Messrs. Shorts' war career, new types of seaplanes will form a large part of the new programme. In fact, I gathered the impression from Mr. Oswald Short that the firm will devote more attention to amphibious machines, both boat and float type, than to future land machines, although he believes in a very large variety of the latter. Mr. Short is very much against land machines flying over the sea habitually. He does not, for example, consider that the Channel should be regarded as a prohibited area for such machines, but where long overseas flights are projected he is most emphatic. He further told me that the hull of the large boat, although of course heavier than the undercarriage of the large land machine, does not weigh anything like so much proportionately as is generally imagined. This I confess was a fact that was unknown to me.

Other advantages he claims for the large boats are that passengers' comfort is very much more easily obtained, and that the expense of numerous intermediate landing stations is done away with, sheltered repair and petrol depots only being required, also the cost of purchasing and keeping up large tracts of land being obviated. In Mr. Short's opinion the claims of the large boat for recognition have not received sufficient attention.

On the life of the machine question Mr. Short put a minimum of four years, which seems to be a favourite figure with builders. Naturally this does not apply to the fabric and incidental repairs, and it is well to remember that cars require overhaul and painting, ships refitting, locomotive boilers changing, and so on, and that aeroplanes are in no way different from these, and must be properly looked after to ensure safety and long life. An old yachting friend of mine once said to me, "If ever you let a boat get ahead of you in her need for repairs you will never catch up." This is a good maxim for aeroplane owners as well.

On details of performances to be aimed at Mr. Short considers that low landing speeds are essential, that a ceiling of 12,000 feet is quite sufficient, as also is a speed of 100 miles per hour. He thinks a good gliding angle important, and points out that it can easily be obtained at a very slight loss in performance.

He is anxious that stringent legislation shall enforce owners not to exceed the maximum load specified by makers, as overload-



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In common with other manufacturers the firm is paying special attention to the comfort of passengers and pilot. Asked his idea of the future pilot, Mr. Short, I am glad to hear, considers it of importance that he should be well paid. I expect there are others who will welcome this opinion, for the more manufacturers who hold this belief the more likely is it that public opinion will follow the lead and provide a livelihood for out-of-work pilots.

On the airship question Mr. Short believes in the large ships of three or four million cubic feet at least, and tells me he has had complete drawings, of his own design, for such a ship for three years.

Of course, one of the difficulties in the way of rapid developments in ships is cost, as private companies cannot afford to saddle themselves with a heavy loss caused through initial experimental work, and it is questionable if the Government will spend sufficient money for this purpose. It will be very interesting to see what funds will be allocated for these experiments, but it is more than likely that the amount will be disguised in a comprehensive vote of credit to the Service.

In conclusion my thanks are due to Mr. Oswald Short for his kindness and courtesy, and the free expression of his views. Many of the more intimate and therefore the most interesting cannot be published at present.

COMMERCIAL FLYING.

In an editorial article which deserves more than cursory notice—if only on account of the standing of the paper itself—"Engineering," of March 21st, expresses its opinion upon "Commercial Flying." Quotation from the article will perhaps give a better idea of the trend of the whole than would any attempt to produce a précis. The following excerpts are therefore given :—

"It needs but little study of some organs of the Press, and one may see visions of pantechnicon vans careering overhead between London and Brighton, and the baker, for some inscrutable reason, delivering his goods to the householder by aeroplane—presumably dropping them into the back yard. All this sort of thing is very pretty and very exciting, but it sounds a little uncommercial, not to say unnecessary. In suggesting the value of a little cold water on some of the present enthusiasm we are not losing sight of the fact that it is less than ten years since Blériot flew across the Channel, and that the art of flying has since then shown a rate of advance which it would be difficult to parallel in the history of the mechanical arts. This, however, is no proof that flight is to be the method of travel and transport par excellence of the future.

". . . What one can do, however, is to attempt some estimate of the commercial possibilities of flying from the point of view at which we now stand. Some assistance in this task is, we think, likely to be given by a consideration of the relative merits of the present forms of transport—the merits which have raised each to the position it now holds. The railway beat the pack-horse, the wain and the canal because it was more speedy, and could deal with enormously greater bulk and weight of material expeditiously and at reasonable cost. In that it is tied to a definite track the railway is inferior to the pack-horse and to a less extent to the wain.

". . . The motor vehicle now to some extent menaces the railway. It has equal and sometimes superior speed and is not tied so rigidly to a track. At sea the situation is simpler; one has but the sailing vessel and the steamship. Speaking quite generally the steamer has beaten the sailing vessel on speed and on freedom of movement, since in its dependence in many trades on prevailing winds the sailing ship is tied to a definite track.

"Into this arena of competitive transport methods the aeroplane and airship are now introduced, and one may ask what their peculiar qualifications are as compared with existing services. In that they have superior speed over all existing transport methods and are not tied to definite routes they are apparently superior to all. . . . If one considers the aeroplane from the point of view we are now taking, it may fairly be looked upon as an example of a glorified motor vehicle.

". . . Concerning the value of the aeroplane for administrative and other work in far countries, General Seely made the interesting statement that our Political Officer at Baghdad reported he found he could in two days carry out inspections and other work which previously had taken him two months. This is a field which one may expect to see greatly extended in less-developed countries and those of large area, but scattered population.

". . . In addition to those types of commercial aeroplane service referred to by General Seely we have also mentioned pleasure traffic as a likely field for immediate development. . . This class of work is, of course, again an example of extension in a field already served by the motor vehicle, and it is interesting and suggestive that all the commercial aeroplane service in being or apparently likely to be in being in the near future is an extension of services already covered by the motor. We do not suggest that the aeroplane may not ultimately force its way into entirely new fields, but clearly its immediate development lies in the greater exploitation of fields already partly worked by the motor-car, which from an abstract traffic point of view it may be looked on as a development of. Before leaving the matter we should perhaps mention express passenger services between important centres as a reasonably likely development of aeroplane service. In this work the aeroplane would appear to be entering the field of the railway rather than that of the motor-car.

"When one attempts to look at the possibilities of the airship from the same point of view . . . it is less easy to determine its position in respect to other modes of transport. Considering oversea service . . . one would naturally look upon the airship as a development of the steamer rather than the sailing vessel. None the less, in its regard for prevailing winds the airship has perhaps more in common with the sailing ship than the steamer. . . . Heavy storms, fogs, etc., affect all shipping to some extent, but will probably affect the airship to a greater extent than the steamship.

". . . Even as things are a greater regard for the weather is not likely to prevent the airship from competing with the steamer in certain fields. In spite of its dependence on the weather the sailing vessel has made a good fight against the steamer, and in view of the rising costs of fuel there would be nothing surprising in a great revival of the sailing ship in certain trades. The immediate commercial field for the airship would appear to lie in the development of long-distance passenger services. Such remarkable improvement over existing times could be shown that high fares could without a doubt be obtained. Of the desiderata towards putting the airship on a commercial basis the most important at the moment is probably the starting of a service in some form, in order that the public may have practical demonstration of its possibility and gain confidence in its safety.

"We have attempted so far to refrain from dealing with the commercial possibilities of flight in terms of unknown developments of the future. What the art now requires is application of what we know, not speculation about what we do not. None the less, progress there will be, particularly in our opinion in the next few years in respect to the airship rather than the aeroplane. . . . It would not be surprising if the aeroplane proved to have already settled down to approximately its final form, and if developments for many years were restricted to engine and other details.

"The airship, however, is in a somewhat different position. Its development was not assisted by the enormous body of workers and the quality of war stimulus which had so much to do with the amazing progress of the aeroplane. The airship, moreover, to give its best efficiency, must be very large, and, consequently, experiment has been more difficult and costly. Without carrying speculation between fast passenger services and the carrying of light but valuable cargoes, it is clear that with a development in size and a falling running cost, great progress may be made with airship services. It is well, however, for the present to assume that the services would be relatively costly and that passengers would be prepared to pay for the great time-saving."

Generally speaking, there is little need for THE AEROPLANE to emphasise the accord between its own views and those of its distinguished contemporary.

If there is a point upon which one is inclined to disagree with "Engineering," it is in its opinion that development in the future will be largely confined to the airship.

It is difficult to believe that this is the case, because, apart from purely structural design, the possibilities of airship development are definitely limited by the density and viscosity of the air.

That is to say, one cannot, by any conceivable means, lift more than the weight of one cubic foot of air, by displacing that cubic foot. And, although possibly no airship has yet attained it, there seems reason to suppose that the form of airship opposing minimum air resistance for any given displacement has been closely approached, and that there is in fact some definite limit to what may be achieved.

But in the design of aeroplanes, though there are doubtless limitations of a somewhat similar nature, the aerodynamic problems involved are much more complicated, and are very much further from having been even approximately solved.

Consequently one feels that the aeroplane still offers a much wider field for research and development than does the airship.

Nevertheless the airship probably offers more immediate prospects of useful commercial development than does the aeroplane.

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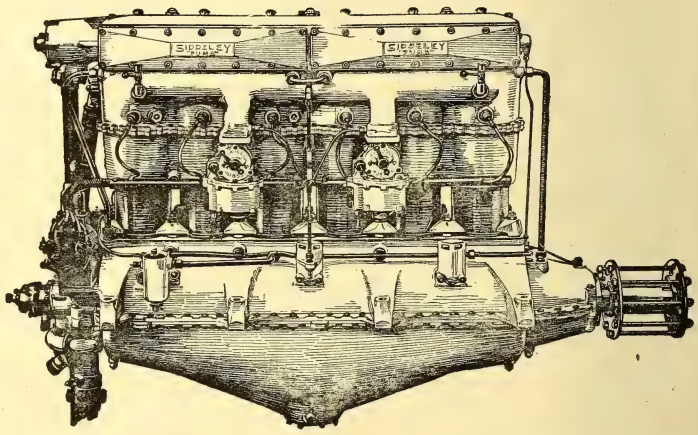
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Y "PUMA"
ENGINE

Its origin; the work it has done and is doing.

THE Royal Flying Corps having decided in 1916 to adopt a six-cylinder water-cooled engine entitled "B.P.H.," the experimental running of which had given excellent results, entrusted its manufacture to the Siddeley-Deasy Motor Car Co., Ltd. Further experimental running on the engine showed the necessity for its being re-designed; this work also was entrusted to this Company. At a later date the engine was given the nickname of the Siddeley "Puma." In the Services it is colloquially referred to as the B.H.P.

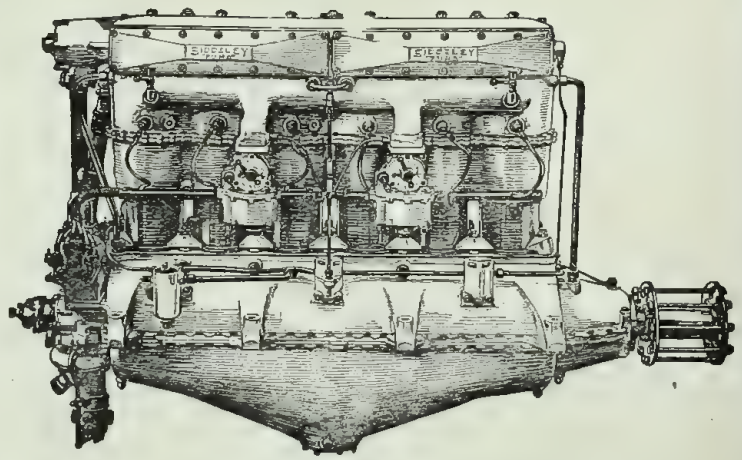
¶ When handed to the Siddeley-Deasy Co. the engine was rated at 200 h.p. The result of the early improvements of design made by the Company called for a rating of 230 h.p. at a comparatively low number of revolutions. To-day the engine is rated at 280 h.p. This shows the remarkable technical developments which have taken place in the Siddeley "Puma."

¶ The Siddeley "Puma"—fitted to the de Havilland aeroplanes used for the main portion of the day-bombing programme of the Royal Air Force—has undoubtedly carried out the most strenuous work which any engine has been called upon to perform. The demands of the Service by constant increases in the military load of the aeroplanes have thereby continuously over-stressed the engine. This fact was particularly emphasised in the Despatch of Major-General Sir H. M. Trenchard, K.C.B., D.S.O., on the work of the Independent Air Force.

¶ Further proof of the high qualities of the Siddeley "Puma" is found in the fact that it has been adopted by the Royal Air Force in its reconstruction programme as the standard vertical six-cylinder water-cooled engine.

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CIVIL AERIAL TRANSPORT NOTES.

United Kingdom.

The delay in passing the Air Navigation Bill through Parliament and the many difficulties encountered in drawing up the new air rules will prevent civilian flying for some weeks.

Major-General Sir F. H. Sykes, the new Controller of Civilian Flying, went to Paris on Friday, March 28th, to join in the deliberations of the International Aerial Commission.

It is expected that on May 1st a complete set of interim regulations governing civilian flying in the British Isles will become law.

The licensing of pilots is considered necessary. The standard will be set sufficiently high to safeguard the interests of passengers. In certifying the air-worthiness of aeroplanes the passenger or freight capacity of each machine will be fixed.

The first regular aerial mail service in the British Empire available for other than official letters will shortly be started between Cairo, Karachi, and Bombay.

Postal arrangements are nearing completion, and in due course an announcement as to rates will be made. Letters from Great Britain for the Indian aerial mail service will have to be marked "Express—Air Service," and an express fee, probably of two or three shillings, will be charged.

The likelihood of frequent interruption by fog and other atmospheric conditions is regarded by the postal authorities as a difficulty which is likely to prevent the introduction of any regular aerial mail service in the United Kingdom.

France.

Recently, three aerial postal services have been established, and a certain amount of data has been accumulated. The experience, however, has not been gained without accident. One of the two mail machines which left Paris for Bordeaux on Sunday, March 23rd, effected the out and home journey in excellent time. But the other machine had a forced landing on the way south and the pilot and passenger were severely injured.

The postal service was carried out in two stages, from Paris to Châteauroux and from Châteauroux to Bordeaux. The time-table arranged for the daily service is as follows:—

Le Bourget (the aerodrome for Paris): departure, 10 a.m.; Châteauroux: arrival, 11.55 a.m.; departure with new machine, noon; Bordeaux, arrival, 2 p.m.

Bordeaux: departure, 12.30 p.m.; Châteauroux: arrival, 2.30 p.m.; departure with new aeroplane, 2.35 p.m.; Paris (Le Bourget): arrival, 4.30 p.m.

The distance for the whole journey is 315 miles; from Paris to Châteauroux is 143 miles, and the rest of the journey is 172 miles.

A daily aerial postal service was also started on Sunday, March 23rd, between Avignon and Nice. From now onwards an aeroplane will be ready to carry mails for Nice brought to Avignon by the Paris-Lyons train which arrives at midnight. A machine will also deliver mails from Nice at Avignon in time for the midnight train for Paris.

A regular postal service by aeroplane is also announced between Rabat (Morocco) and Algiers. Letters were carried between these two towns on Sunday, March 23rd.

Germany.

A Berlin telegram states that the regular aerial postal service which has hitherto been carried on by a German Aircraft Company between Berlin, Leipzig, and Weimar, and Berlin and Hamburg, will be extended during April to Hanover, the Rhineland, Westphalia, Frankfort, Breslau and Warnemuende. The service to Warnemuende will be particularly important for passenger and postal traffic to Scandinavian countries. Warnemuende will also be the starting-point for oversea traffic by seaplane.

Italy.

What is probably the longest European regular postal service was started on March 2nd when four Caproni biplanes, piloted by service aviators, under the command of Colonel La Polla, with, among the passengers, Major Voco, who is at the head of an Italian Aeronautical Commission at Vienna, left Padua and arrived at Vienna, after being in the air over four hours. The distance is about 500 kilometres. This service will be continued regularly from now onwards, two machines leaving Padua and two Vienna every third day.

On the same day it was announced that the Government has given free passes on the railways to Members of Parliament desirous of using the Rome-Naples Airway. Five of the Deputies have, at the time of writing, taken advantage of the speedier route. Cs. are the machines used.—T. S. H.

Norway.

The Managing Director of a Norwegian Aviation Company, who has just returned from a visit to England, where he conferred with the British Authorities regarding the future of traffic by air between Great Britain and Norway, has stated that no such traffic can possibly be established this year, owing to the many questions of International Air Laws which have to be settled first, and also to the high prices of aeroplanes.

Peru.

The Posfmaster-General at Lima is asking for offers from European and American firms for establishing an aerial mail service.

Postal Air Services.

A very interesting series of experiments is being carried out now, according to a contemporary, with a view to the reduction of bulk in mails for air carriage. Full details cannot yet be given, but the general principle will be reduction of bulk by photography.

Experiments in cutting down weight of paper, envelopes, sealing wax, etc., were soon abandoned, as they reduced bulk and tonnage so slightly. A bold plan was then suggested, let all letters for air-post be typed or written on a standard size of paper, and the sheets then photographed down to postage-stamp size. The photographs would cross by aeroplane or airship, and be magnified at the other side back to standard sheet size.

Under such a system letters could be either posted open by the public and photographed by P.O. officials sworn to secrecy, and enlarged by officials at the other side before delivery; or, in the case of correspondence of big firms, they could be posted in midget photograph form.

It would pay a big firm with branches in America and Great Britain to have the necessary photographic apparatus at each side of the ocean. With the help of photography what is now a 300-ton mail could be cut down to 30 tons weight. The sentimental love letter could, of course, still go in the old form—if paid for.

One is not so enthusiastic over the scheme as the contemporary. It is, of course, very old, as the system of photographing letters was used in the siege of Paris. One cannot imagine private firms to-day laying down special plants to photograph their correspondence. In fact, the suggestion seems likely to prejudice people against postal air services.

Cosmos Enterprise.

It is frequently alleged, and unfortunately with only too much truth, that the British manufacturer is lacking in enterprise. He is very apt to adopt the "take it or leave it" attitude, and to assume that because he makes good goods everybody in the world must rush to buy exactly what he pleases to offer them.

Sometimes when one asks for information from a British manufacturing firm, one receives an utterly inadequate and unintelligent reply from a mere advertising agent who has no technical knowledge whatever, and at such a time one despairs of one's task, which chiefly consists in these post-bellum days, in doing one's best to help British manufacturers to secure foreign trade. It is therefore all the more pleasing when one comes across a firm which not only conducts its business in a businesslike way, but really goes out of its way to impress people with its up-to-date business methods.

The particular case which one has in mind is The Cosmos Engineering Co., Ltd., Bristol, who are already becoming famous as the makers of the "Mercury" and "Jupiter" stationary radial engines. A request for some information concerning these engines, by a correspondent of this paper, recently produced the most convincing possible proof of the firm's capabilities. Complete specifications of each engine were sent, together with beautifully executed photographs of the engines on quite a large scale. All the information concerning each engine was set out in the simplest, and at the same time fullest, possible manner, and was enclosed, together with the photographs pertaining thereto, in a separate jacket of the Government office type.

The way in which the whole thing was done gives one the impression that the firm is truly an engineering firm and not merely a retail shop, and that the firm is really out after business.

Though The Cosmos Company is a very young company, so far as aeronautical engineering is concerned, it is evident that it is bound to come into the very front rank of engine manufacturers, and those who remember the firm under its former name of Brazil, Straker and Co., Ltd., will need no convincing that its work as well as its methods are of the highest class.

A Works Presentation.

At a concert held in the Town Hall, East Cowes, I. of W., on Wednesday, March 19th, Mr. S. A. Bex, Works Manager of S. E. Saunders, Ltd., was presented by the employees and staff with a silver tea-service, a marble clock and a gold Albert with a medallion suitably engraved.

Mr. Sweetland, the Works Accountant, made the presentation on behalf of the employees. He spoke of the high esteem and respect in which the employees held Mr. Bex, and how much they regretted that he was leaving.

AIRCRAFT FINANCE

THE LIBERATION OF COMMERCIAL FINANCE.

In freeing industry and commerce from official interference in respect of new capital emissions and reorganisations the Government has acted boldly and wisely.

The policy is a brave one, because an adequate supply of money must still be raised to cover the deficiency between national expenditure and revenue. Evidently the Financial advisers do not consider that the superior attractions offered by private borrowers will react seriously on the success of State borrowing.

The Wisdom of the Move.

The policy is a wise one, because industry and commerce of the country will be able to complete more satisfactorily and with less obstacles its post-war development programmes. In this respect the Aircraft Industry is intimately concerned with the new and enlightened policy.

Merits Can Have Full Play.

No longer can the enthusiastic sponsors of the multitude of commercial aeronautic projects conceived to revolutionise the world's transportation facilities from Chili to Peru point with scorn at the narrow-minded, short-sighted officials as the culprits who have frustrated their noble efforts.

The excuse that the official prevention of new capital creations completely nullified the translation of their ideas into facts is no longer valid. They are at liberty to do just what they desire now in the matter of raising the capital necessary for the consummation of their schemes, with the exception of exporting capital for development abroad.

This liberty of action means a great deal to industry as a whole, but one is chiefly concerned just now with these aircraft ventures. How will they stand in the opinion of the speculative investing public? Will they be able to compete successfully with the host of other borrowers whose schemes have been kept in abeyance? What sort of an appeal will they make in order to claim kind consideration? What are their chances of success?

Public Interest in Aerial Matters.

Now, as to the views of the generality of the public, there cannot be any doubt whatever that aerial transport ventures appeal very strongly to their imagination. It is, indeed, widely recognised that the new order of things possesses great profit-earning possibilities, but these possibilities have yet to be demonstrated by actual experience.

Attracted by the novelty, the investor will be tempted to bite, provided there is reasonable proof of the financial soundness of the scheme. The ability to provide such proof will determine whether the requisite money will be forthcoming.

Spurious Statistics and the Promoter.

An elaborate array of statistical matter, "faked" or otherwise, with plausible but gaudily coloured deductions will not suffice to convince the average investor. That is the stock-in-trade of the reprehensible company promoter out on the get-rich-quick stunt, regardless of the consequences, and has worked wonderfully well with the gullible section of the public.

This objectionable financial parasite invariably does a lot of harm, moral and material, to the industry he "promotes." Aircraft cannot afford to watch "wild-cat" promotion.

The High Cost of Finance.

As to the terms aeronautic ventures must offer to compete successfully against the host of industrial borrowers, it is obvious that the experimental character of the business at present would justify the investor in demanding a proportionately higher rate of interest on his money, consonant with the greater risk involved. And the average value of money will be generally high for a long time; for, apart from the colossal amount required for reconstruction and to repair the wastage of war, the industrial fabric of the world as a whole has been living on short rations of money, and must necessarily cover the accumulated deficiency.

Undesirable Types of Capital.

Possibly in order to enlarge the circle of investors, some of the ventures, when they happen to come along with an appeal for capital, will seek to obtain the money in the shape of shares offering a fixed rate of interest, bearing cumulative rights thereto, and a participating privilege in a fixed proportion of profit made over a specified total.

This type has become rather common of recent years. The participating rights to an additional dividend proved an alluring sweetmeat a few years ago; now the bait is no longer so attractive to the average investor, who has begun to recognise the faults of the scheme.

Misnamed Shares.

It is all very well to possess a Preference share with cumulative rights to the fixed dividend; that is to say, when the share is really a Preference share well secured by the earning capacity of the company; but when it is scarcely better in reality than an Ordinary share, as is so often the case, it is a different matter. Investors realise now that in many cases such as this they provide practically the whole of the capital necessary for the development of the business, and the promoters receive as purchase consideration a lump sum in cash from the money publicly subscribed and the whole of the Deferred shares created.

The capital represented by these Deferred shares is very small in proportion to the total capitalisation, but the proportion of the profits divisible among the Deferred shares is by comparison enormous. In plain English, the Deferred shareholders take the lion's share of the profit made, and stake only a small amount of money.

A Faulty Practice.

As these Deferred shares of the nominal value of a few pence each are really Founders' shares, why not be plain and label them as such. Were this to happen, the investor would not be so pleased to provide the money asked for, not because Founders' shares have gone out of fashion, but because the result of experience has proved beyond all question the objectionable and pernicious character, the faults and deficiency, of this type of public company capitalisation.

Fair Treatment for the Investor.

It is greed and selfishness that is responsible for this particular practice of creating Deferred or Founders' shares, which, if the venture is successful, scoop up the lion's share of the profit, and which, if there should not be success, represent only a small loss of capital. It would be infinitely better if shareholders were offered

Ordinary shares with dividends fluctuating according to the success of the business, and the Founders were satisfied with a reasonable payment partly in cash and partly in Ordinary shares. It would be sounder finance.

CURRENT TOPICS.

A New Cellulose Issue Coming.

Arrangements are now being made for placing with the public some capital of the British Cellulose and Chemical Manufacturing Company, whose creation has provided so much discussion. The amount is about £1,250,000, and will take the form of Preference shares with additional participating rights in profits. It is expected that the issue will make its appearance in about a month's time.

The Financial World Regains Confidence.

There is more confidence in the Financial World owing to the more hopeful labour prospects, and if it were not for the uncertainties surrounding the Budget things would be really cheerful. As it is there has been an awakening in oil shares with speculative interest broadening out. Possibly greater things will be witnessed in these shares before long, for the way the commercial possibilities of the liquid as a fuel and the constant increase in the utility of the by-products are being painted augurs well. The oil enthusiasts acclaim that "no home is complete without a few shares."

Prices Maintained.

Aviation and kindred shares are claiming very little interest, though prices are maintained wonderfully, all things considered. People are wondering if there is to be a Napier bonus, and, if so, will it be equal to that of last year. The Dunlop Rubber Co. is issuing £1,150,000 7 per cent. Cumulative "C" Preference shares.

British Aluminium Profits.

The whole output of the British Aluminium Co. since the beginning of 1915 has been used exclusively for military purposes, including aircraft. Last year's trading profit was £351,607, and the extraneous income £68,729, against £368,510 and £55,153 for 1917 and £344,280 and £35,239 for 1916. The net profit at £146,202 compares with £159,324 and £155,171, and the dividend is unchanged at 10 per cent.

English Electric's Aircraft Branch.

Dealings have recently started in the shares of the English Electric Co., the price being about 26s. 6d. This £5,000,000 concern was formed to acquire control, through exchange of shares, of the Coventry Ordnance Works, the Phœnix Dynamo Manufacturing Co., and Dick, Kerr & Co.

Great things are expected of the combine, concerning which a reference was made some time ago, and it is of domestic interest, because all three of the components have been intimately associated with aircraft.

Aviation Insurance Competition.

Competition—that is to say, healthy competition—is good for business, and it was on the cards that the Aviation Insurance Association would not be allowed to scoop up all that commercial aeronautics promises to provide without some struggle from the rest of the insurance world. Over thirty of the leading offices have now elaborated a scheme of aviation insurance. This development will demand a further discussion later on.

A Promoter's Affairs.

The public examination of Robert Taylor, 97, New Bond Street, W., was held last week. Formerly interested in the motor trade, the debtor was more recently intimately associated with aircraft business. His statement of affairs showed liabilities £50,853, of which £7,853 were expected to rank, and an estimated surplus in assets of £32,146. The debtor came from the U.S.A. to this country about 1914, and on behalf of his wife, who possessed separate estate, began a motor and engineering business. She provided all the necessary funds in return for two-thirds of the net profits. For some seven months in 1916 he was in New York acquainting himself with the latest improvements in aircraft designs and engines, and while there registered several provisional patents. Early in 1917 he returned to England and devoted himself to working up aircraft inventions, experimenting, etc., and subsequently registered a number of patents in respect of aeroplane engines, etc., in association with others, with the object mainly of manufacturing and dealing in aircraft and component parts. He formed, or assisted in the formation of, a number of companies, of several of which he was at the date of the receiving order a director. Amongst these were the following:—Wm. King & Son, Patey & Co., Cowper-Coles Aircraft Co., D. & E. Birdwood, Associated Aircraft, Weldon Engineering Co., Draycott Engineering Co., Tooting Aircraft Co., and Engineering Proprietary, Ltd. The causes given for the failure were delay in dealing with an application for sanction to an increase in the capital of a company with which he was associated, and the action taken by a creditor to recover a sum of £5,000. Replying to the Official Receiver, the debtor said he had never previously been in financial difficulties. The petitioning creditor had undertaken to release his claim to enable a scheme for the arrangement of affairs to go through. The examination was adjourned until May 6th upon the application of the Official Receiver.

NEW COMPANIES.

Southern Counties Garage, Ltd.—Private company. Registered March 22nd. Capital £20,000 in £1 shares. To enter into an agreement with the Selsdon Aero Engineering Co., Ltd., and to carry on the business of motor vehicle and aeroplane proprietors and dealers, etc. The first directors are:—G. Campling, Gilba, Godstone Road, Purley, Surrey; C. E. Coleman, St. Maries, Dale Road, Purley, Surrey. Registered office: Brighton Road, South Croydon, Surrey.

Motor Exchange and Mart, Ltd.—Private company. Registered March 25th. Capital £10,000 in £1 shares. Manufacturers of and dealers in electric, steam, gas, oil and other motor vehicles, proprietors of self-starters for motor-cars and aeroplanes, etc. The subscribers (each with one share) are:—J. R. Burton, Upcote, Hammers Lane, Mill Hill, N.W.7; L. Waterhouse, 25, Gloucester Gardens, W2, gentleman. First director: J. R. Burton. Registered office: 30, Highgate Road, N.W.

An Important Amalgamation.

An amalgamation of a number of firms which is of considerable importance to the Aircraft Industry has recently taken place.

The combine is now known as the English Electrical Co., Ltd. Among the amalgamated firms are the Coventry Ordnance Works, Ltd., Dick, Kerr and Co., Ltd., of Preston, and the Phœnix Dynamo Manufacturing Co., Ltd., of Bradford.

All of these firms include the manufacture of aircraft among their productions, and it is gratifying to note that they intend to continue concentrating on aircraft work under the amalgamation.

The Coventry Ordnance Works, Ltd., did a considerable amount of experimental work before the war, and, in fact, had two machines entered for the British Military Trials of 1912. Furthermore, they fulfilled a large number of production contracts during the war.

Dick, Kerr and Co., Ltd., have been engaged on the production of flying-boats of the largest types, and are at present building a machine much larger than any yet produced.

The work of the Phœnix Dynamo Manufacturing Co., Ltd., is very widely known. They have built flying-boats to official designs, and have also designed their own machines, as, for example, the Phœnix "Cork." In this connection it is interesting to note that all the flying-boats tested and flown from the Marine Acceptance Depot at Brough, which is purely a Government establishment, were built by the Phœnix Company.

It is of interest to note that Mr. W. O. Manning, one of the pioneers of British aviation, who was building aeroplanes in 1908, is the Phœnix Co.'s chief technical official.

The Aircraft work of the English Electric Co. will be done at the Phœnix Works at Bradford. This has several advantages. It combines the efficiency of centralised production with the wide and varied experience of the three firms. The English Electric Co. will, therefore, be in a position to cater adequately for post-war aircraft requirements of all kinds.

The World's First Air Traffic Manager.

The announcement made in certain sections of the Press that the first Aerial Traffic Manager in the world has just been appointed is hardly correct, The Aeroplane is informed.

Mr. Holt Thomas's Company, Aircraft Transport and Travel, has had the services of Mr. A. S. Baxendale, late Manager of the Pacific Cable Board, etc., at its disposal for some time, and for a period of several months Mr. Baxendale has been investigating details and making arrangements generally.

The confidence of Mr. Holt Thomas and General Sir W. S. Brancker, who has lately joined him, is placed chiefly in the carriage of mails by air rather than passengers, although passengers will undoubtedly be carried by the Mail Services.

It is to this point that Mr. Baxendale has specially devoted himself. His experience is a long one. He began his career with the Eastern and Eastern Extension Telegraph Companies, and was responsible later for the organisation of the Postal and Telegraph Departments of the Federated Malay States.

Mr. Baxendale is, therefore, well equipped for examining into Aerial Mail Services—apart from technical flying matters.

A Blackburn in London.

A Blackburn monoplane of an original design will be on view at Harrod's on and from Monday next. It is a side by side two-seater, with a two-cylinder 46-h.p. Gnat A. B. C. engine. The machine is intended for pleasure-flying by people who wish to run their own machines and cannot afford the luxury of big machines of the types used for war flying. The makers claim that the machine has a factor of safety to 7 to 1 with full load, and intend to sell it for £450.

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AERONAUTICS AND THE LAW.

COMMON CARRIAGE BY AIR.

By "The Lincoln Imp."

There are carriers and carriers, but a *common* carrier is subjected to peculiar liabilities originating in the custom of the realm and incorporated in common law. They are onerous liabilities.

A carrier of goods may be a common carrier, or may not. If he undertakes to carry for anyone who asks him, he is a common carrier. If he limits his customers to particular persons he is not.

The practical question then arises:—If for hire or reward you undertake to carry goods *by air* for anyone who asks you, are you a common carrier, and therefore, subject to peculiar and onerous liabilities?

Being Robbed by Arrangement.

There is no use turning to the Statute-book to see if the definition of a common carrier is wide enough to include carriage by air. No Statute imposed the liabilities or made a carrier "common." The common carrier, like Topsy, was not made but "growed." He is a child of the common law, and his special liabilities as insurer of the goods he carries may have been laid on his neck because of a little habit he had of being robbed by arrangement and sharing the spoils with the bold highwaymen.

At first blush, then, it would seem absurdly anachronistic to speak of a common carrier by air. Carriage by air, as we know, is a thing of to-day and to-morrow, whereas the ancient common law "in the solemnity of our legal phrase," as Blackstone puts it, is that which has been customary time out of mind, or time whereof the memory of man runneth not to the contrary. How can carriers by air be said to have been subject to any customary liabilities time out of mind?

Laws "Mixed as our Language."

The answer is clearly put by Blackstone:—

"Our antient lawyers, and particularly Fortescue," says he, "insist, with abundance of warmth, that these customs are as old as the primitive Britons; and continued down thro' the several mutations of governments and inhabitants to the present time unchanged and unadulterated. This may be the case as to some: but in general, as Mr. Selden, in his notes, observes, this assertion must be understood with many grains of allowance: and ought only to signify, as the truth seems to be, that there never was any formal exchange of one system of laws for another: tho', doubtless, by the intermixture of adventitious nations, the Romans, the Picts, the Saxons, the Danes and the Normans, they must have insensibly introduced and incorporated many of their own customs with those that were before established: thereby in all probability improving the texture and wisdom of the whole by the accumulated wisdom of divers countries. Our laws, saith Lord Bacon, are mixed as our language: and as our language is so much the richer, the laws are the more complete."

In other words, the common law which is as wide as the realm and in force even in America is also as elastic as the language and the customs of the people, and when new methods of carriage come into existence applies to them as it does to the old.

This is no place for a history of "methods of transport," fascinating subject as it would be, but in tracing the various vehicles used by all types of carriers from Druidical, or even palæolithic times, right down to the present day, it may be doubted if the jump from motors to aeroplanes is greater than other changes which have occurred in the course of the centuries since every man humped his own pack. Yet the liability of the common carrier has endured through them all.

The Railway Analogy.

Take the analogy of railways:—

To Mr. Weller, Senr., railways no doubt were anathema. Noisy and conscienceless competitors. But to the common law of his day the railway company was nothing but another common carrier with the same rights and liabilities as the willing Mr. Barkis or Mr. Cripps the Carrier. Railways must take the law as they found it, and could claim no exemption based on their novel form of traction. The owners of "The Rocket" were not limited in their liability to the exercise of reasonable care, but, with one or two exceptions, had the liability of insurers in respect of the goods they carried.

A carrier may be "common," carry he by land or by sea, by road, rail, river or canal, so why not by air? Clearly one who plies a universal trade of carriage by air is a common carrier at law apart from statutory provision. But here comes the snag—he has not the same statutory protection that other common carriers have.

The liability of common carriers, though not created by statute, has been materially modified by statutory provision. In particular by the Carriers' Act, 1830. This Act extends to all public conveyances by land, including therein railways, which, being as yet novelties, were not expressly mentioned in the Act. The preamble remarks that it is become the common practice of bankers and others to send by the public conveyances "packages containing money, bills, notes, jewellery, and other articles of great value in small compass; and that the result is that common carriers have become exposed to great and unavoidable risk, and have sustained heavy losses."

Articles of Great Value.

We may here interpose that you could not want a neater definition of merchandise which will be stowed in the fuselage of aircraft flying as carriers than "articles of great value in small compass." So that without the protection of the Act common carriers by air will become exposed to great and unavoidable risk and sustain heavy losses. The protection which the Act gives is freedom from liability as a common carrier of such goods exceeding £10 in value unless a declaration of value is made, and an increased charge is paid. But, unfortunately, for the aerial [illegible] Act applies in terms to carriers by land only, and, therefore, affords him no protection.

There is just one qualification which it is necessary to make. Possibly it might be argued that a common carrier by air is a common carrier by land since he does carry the goods by land in taxying, taking off and landing. "The Imp" thinks this argument unsound, but there is some support in the decided cases for the suggestion that an accident to the goods in taxying, taking off on landing would be within the protection of the statute. For it was held in Le Conteur v. L. and S.W. Ry. (L.R. 1 Q.B., 54) that when a carrier makes one contract for carriage partly by land and partly by water, the contract is divisible so as to bring that part which applies to carriage by land within the Carriers' Act, 1830.

The moral of the whole matter is that the point should not be overlooked when legislation is toward (as it has been overlooked up to the present), but the liability of common carriers by air should be carefully defined and limited by Act of Parliament.

Current Cases and Comments.

[The parties in these cases are given imaginary Christian names for clarity of thought and convenience of preference. Thus, a Plaintiff will usually be called Peter, and David will be the name of a Defendant.]

Musgrove v. Pandelis (1919) 1 K.B. 314 and (1919) W.N. 79.

Peter lives over a garage kept by David, whose unskilled chauffeur Charles starts up a car in the garage. The carburetter catches fire. It does not occur to Charles to cut off the petrol. Peter's rooms overhead are burnt. Is David liable to Peter?

Once upon a time the common law presumption was that a fire which could not be traced to anybody else was kindled by the householder on whose premises it was started. In the case of accidental fires this presumption was removed by s. 86 of the Fires Prevention (Metropolis) Act, 1774, which enacts, "No action shall be maintained against any person in whose house or other building any fire shall accidentally begin."

David says that the fire in the carburetter was not started wilfully, and could not have been prevented by the exercise of care. It therefore began accidentally, and no action lies. But Peter replies that the fire that burnt down his rooms began through Charles's negligence in not cutting off the petrol. The Court agrees with Peter, and adds that, if a man brings on his premises a dangerous thing which is liable to cause fire, such as a motor-car with petrol in it, the carburetter of which is not unlikely to get on fire when the engine is started, and a fire results, though without any negligence on his part, he must be held liable, the statute notwithstanding, for the rule is that he must keep such a thing under control at his peril. See Rylands v. Fletcher (1868) L.R. 3 H.L. 330 and the article "Trespassers, Beware!" The analogy of aircraft and hangars is obvious.

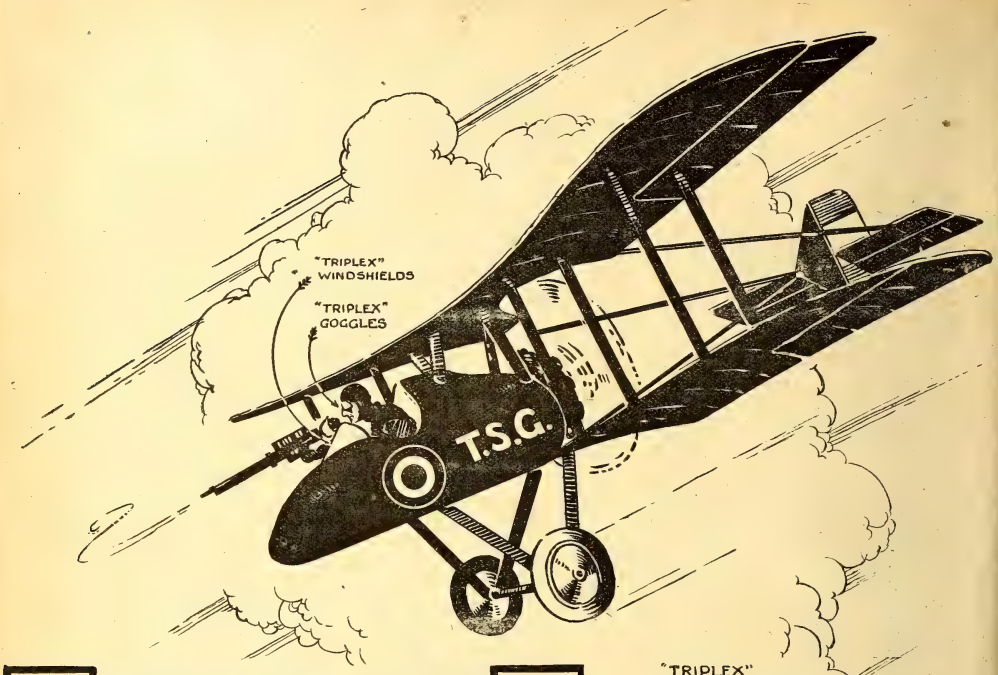
Trinder v. G. W. R. ("Times," March 1st).

David's motor-'bus carries passengers along a country road overhung by trees. David lops the branches by consent of the owners to provide a free passage, but Peter, a passenger, is hit by a branch.

Peter says it stands to reason that David was negligent (*Res ipsa loquitur*). His driver should have avoided the branches.

David answers, "Not so. Peter must prove that my driver knew or ought to have known that there was serious danger of colliding with the branch and did not take reasonable care to avoid a collision." Peter, failing to prove these points, failed in his action.

By analogy a passenger in an aerial 'bus will have to prove more than that the 'bus hit a tree in landing, whereby he was injured. He must prove that the pilot knew or ought to have known that there was serious danger of colliding with the tree and did not take reasonable care to avoid a collision. This will be difficult to prove if the tree loomed up out of a fog. But it seems to be seen if the analogy will in fact be applied when the case arises for decision.—The Lincoln Imp.

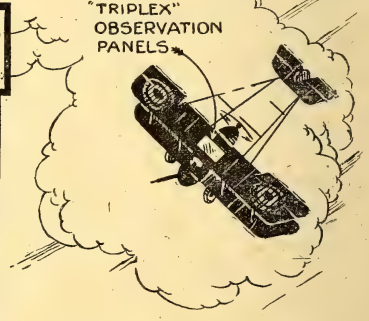


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LIGHTER-THAN-AIR CRAFT.

A lecture on "Lighter-than-Air Craft" was given by Lieut.-Col. T. R. Cave-Browne-Cave, C.M.G., R.A.F., at a meeting of the Royal Aeronautical Society held in the Theatre of the Royal Society of Arts, John Street, Adelphi, London, on Wednesday, March 26th. Brigadier-General E. M. Maitland, D.S.O., R.A.F., presided.

From the lecture the following sections have been selected :—

Since I was asked in September last to read this lecture conditions have so changed that it has been necessary totally to re-cast and re-write what I then proposed to say. A large amount of information as to the actual achievements of airships has been published and also perhaps an even larger amount of speculation as to their future possibilities. What will, therefore, probably be of interest to a technical society such as this is a general outline of the ships as they exist at the stage to which they have been developed during the war.

The extent of the detail which I have been allowed to include in the lecture, although such matters have not been published before, leaves the Society with a very deep debt of gratitude to the Admiralty.

Distribution of Weight and Rigidity of Envelope.

The problem of suspending a weight from the lightest possible gas container is one which involves careful consideration of the ordinary principles used in calculating the distribution of loads and bending movement in ships and similar structures. The rigidity of the gas container may be provided in various ways. The simplest is to make it solely of a perfectly flexible fabric with no rigid stiffening whatever. Such an envelope is referred to as a non-rigid.

An alternative method of maintaining the shape of the gas container is to form the hull of the ship as a rigid structure of sufficient stiffness to maintain its own shape independent of any internal gas pressure.

Intermediate between these two main types there is one referred to as the semi-rigid. This class is provided with a rigid keel of sufficient strength to maintain its rigidity under the action of the various loads of the ship. The keel is carried by the envelope which contains the gas, but unlike the rigid the envelope is dependent for its shape upon the excess of internal pressure.

There is yet another type, one which is extensively used in Italian airship construction, in which the keel is not capable of taking a bending movement but is capable of taking longitudinal compression when held straight by the main envelope.

Of these various types of construction it may generally be said that for small ships the non-rigid arrangement is entirely satisfactory. For very large ships it becomes necessary to divide the gas chamber into a number of compartments. For this reason a rigid structure, which calls for no excess of internal pressure, will almost certainly have to be adopted for airships of the largest class.

The Semi-Rigid Type.

The semi-rigid is a type which has been practically undeveloped in this country. The Italians, however, have done a great deal of work on ships of this description, but it appears very doubtful whether, all other things being equal, there is much to be gained by the addition of a rigid keel to a non-rigid envelope. The keel of a semi-rigid ship has to be sufficiently strong to take the loads of the airship without the assistance of the envelope, because in the event of pressure in the envelope falling the keel would collapse, and the ship could not be restored to her correct shape by making good the pressure in the envelope.

The general consideration of the rigidity of an envelope is one of very considerable complexity, and may be most conveniently tackled by arranging a model experiment in which the lift of the gas and the distribution of load is reproduced in a small envelope filled with water and inverted, the weight of the water acting downwards corresponding with the lift of the gas acting upwards in the full-size ship.

The load is taken by a number of wires arranged similarly to the riggings and passing over pulleys which support the equivalent of the load of the air-ship. The weight of the planes and other envelope fittings can similarly be represented. Pressure in the envelope is maintained through a tube connected to a water reservoir, the level of which can be varied.

Balloons Filled with Water.

The method of carrying out these experiments is a very simple one. The various loads are distributed along the envelope and the pressure is reduced until the fabric begins to pucker at some point. The value of this pressure is noted.

The distribution of load may then be varied in order to reduce the compression in the fabric at this point.

It is desirable to arrange the water model so that the whole system can be inclined up or down at one end in order to reproduce the conditions of the airship pitching. Provision against pitching occasions greater difficulty than the mere satisfactory suspension of the load when the ship is on an even keel. It is not possible to give any simple rules for arranging the rigging of the non-rigid ship, but one system which has been found generally satisfactory is to lead wires from points distributed along the envelope at intervals suitably proportioned to the lift of gas at each section. This provides for the suspension of the load on an even keel.

Independent wires should then be provided to prevent "fore and aft" motion of the airship car when the ship becomes inclined. It will easily be seen that the tendency to deform the envelope very materially reduces as the distance of the load from the envelope is increased and also if the load can be divided into one or more separate units.

The point at which the riggings are attached to a circular envelope is necessarily some distance below the axis. If it is possible to raise the level of these points of suspension to a higher point on the envelope, the height of the ship can be correspondingly reduced.

Further, the direct longitudinal compression due to the riggings is applied at a point considerably above the axis of the ship, i.e., at a point where the difference of pressure and therefore the longitudinal tension of the ship is greater than at the lower levels. This principle was satisfactorily achieved in the system invented by a Spaniard, Signor Torres Quevedo, and subsequently developed by the Astra Company, of Paris.

The Trilobe Cross Section.

The envelope is made of trilobe cross section and the riggings are led into the envelope at the bottom ridge and parted into two fans of strings secured to points along the top ridges.

To constrain the envelope to this trilobe shape, curtains of ordinary unproofed fabric are laced to the ridges. These do not, however, divide the ship into separate gas compartments.

The system adopted by the Parseval Company is to provide a strong rigging band as a kind of girdle on the lower part of the envelope. To this the car is attached. The shape of the envelope is maintained by reinforcing bands of webbing stuck to the surface of the envelope along trajectories, the position of which is determined by experiment.

Both these systems and also the semi-rigid design involve considerable complexities and are only rendered necessary in order to suspend a concentrated weight as close as possible to the envelope. If, however, it is not necessary that the weight should be concentrated and it is possible to distribute the majority of the weight in a number of separate cars or along the envelope itself, these systems and the complexities they involve can be abandoned.

The Structure of Rigid Airships.

The framework of a rigid airship consists of a number of rigid longitudinals connected by a number of transverse members, which form rings at intervals along the length of the ship. Each of these rings is braced in its own plane by a number of radial wires. The gas bags are placed in the compartments between these bulkheads of radial wires. The outer cover is stretched over the outside of the framework.

In order to transmit the upward pressure of the gas bags to the framework, nets are provided and attached to the inner edges of the various rigid members of the framework.

The weights carried by the ship are mostly placed in a strong keel, which runs along the bottom of the ship. The function of the keel is primarily to distribute the load of these weights to the main transverse sections of the ship. The cars which are suspended below the hull of the ship are also attached at points which bring the load on to the main transverse bulkheads. Special lift wires are arranged, in addition to the radial wires, to transmit the load of the keel to the upper part of the framework.

If, for any reason, one gas bag becomes much less inflated than those on either side of it, there will be considerable pressure tending to bulge the radial wires towards the empty bag. Tension in these wires may produce very serious compressive strain in the transverse members, and in order to assist in resisting the bulging action an axial wire is often led along the axis of the ship and secured to the wires of each bulkhead.

Sub-Division of Gas Space in Large Airships.

The necessity for dividing the gas space into a number of separate compartments is not primarily due to the possibility of losing the whole of the gas from one compartment by leakage from external damage to the fabric. As long as an airship remains on an even keel the pressure at the two ends of the ship will be approximately the same, but if the airship be now placed vertically head upwards the excess of the internal pressure at the top of the ship over that in the air outside will be considerably greater than that excess at the bottom of the ship. This is due to the difference in weight of a column of air and a column of hydrogen equal to the length of the ship.

The same variation of internal pressure will obtain in a lesser degree when an airship in ordinary flight has one end raised considerably above the other. It is convenient to remember that this variation of the difference of pressure amounts to 1 mm. for each metre difference in level. In the case of a non-rigid, which has to maintain a minimum difference of pressure between the inside and outside of the fabric of 15 mm., the effect of having the bow of the ship raised considerably above the stern will produce a large increase of pressure difference in the bow and consequently an increase in tension of the fabric at that point.

In a short ship this increase of pressure due to inclination of the ship is small, but in ships of great length the increase would be a serious one. For this reason it becomes necessary to divide a long ship into a number of compartments, but this is only effective if the bulkheads, which isolate one compartment from another, are capable of maintaining difference of pressure between their two sides.

Bow Stiffening for High Speed.

The pressure which it is necessary to maintain in a non-rigid envelope depends upon two things:—Firstly, the pressure which is necessary to prevent the envelope from collapsing under the influence of the rigging tension; and secondly, the pressure which is necessary to prevent the bow of the envelope being blown in, due to the excess of external pressure caused round the bow of the envelope by the motion of the airship forward.

This stiffening of the bow becomes a matter of greater importance as the speeds increase. There is always the possibility in "bumpy" weather, when the height of the ship varies rapidly, that the pilot may let his pressure fall momentarily too low. The bow of the envelope then blows in and forms a curious concave cup shape, in which it remains till the speed is reduced or the pressure is raised. No damage will probably be done so long as the reinforcement of the bow is not of such a nature that it will break and puncture the envelope. It may very probably be necessary to provide a separate small compartment at the bow kept at a higher pressure than that of the rest of the envelope.

This would allow high speeds to be attained without a corresponding increase in envelope tension.

Planes.

In order to stabilise the motion of the ship it is necessary to provide the envelope at the after end with planes. These are provided at their after edges with rudders capable of steering the ship either vertically or horizontally. The construction of these planes somewhat resembles that of the wing of an aeroplane. Fabric is stretched over a framework and is doped in order to render it taut. The surfaces are, however, practically flat and the loading is considerably less than that provided for in an aeroplane.

The planes are supported from the surface of the envelope by guy wires attached to suitable points on the envelope, and are prevented from pushing their inner edges into the envelope by skids or wooden bearers. The maximum intensity of air pressure occurs towards the forward edge of the planes, and it is therefore desirable that the leading edge should be short.

The planes of a rigid ship are attached rigidly to the hull framework. In the latest German ship these planes are made some six feet thick at the root and faired off into the rudder and tapered to the outer edge. They are, therefore, almost totally self-supporting and require no guy wires.

Fabrics.

The fabrics used in airships are of three main types:—

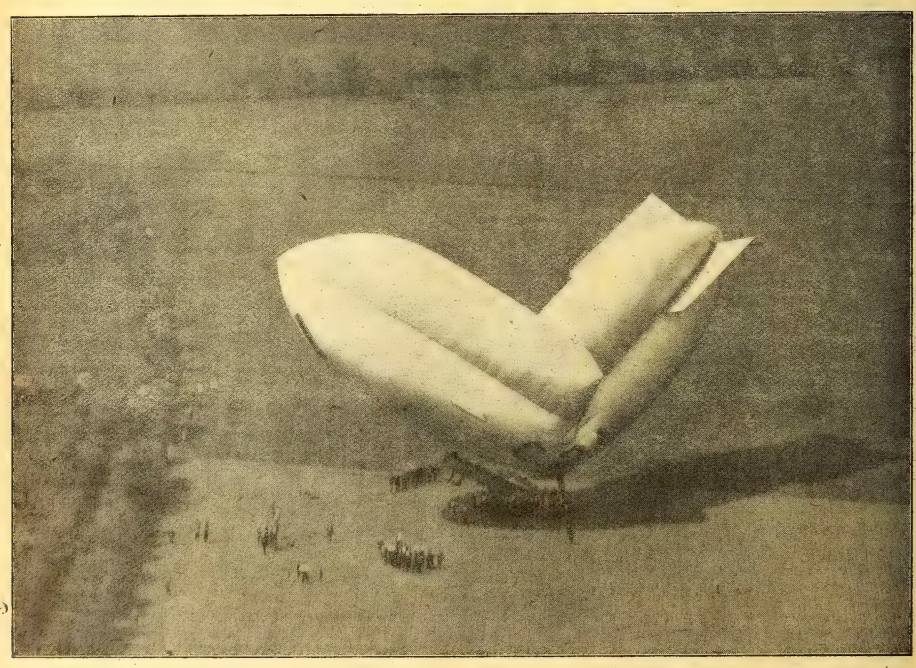
1. Gas-tight fabric, such as that used for gas bags of a rigid ship.
2. Outer cover fabric, of which the principal function is to form a rain and weatherproof outer cover to the ship, both as a fairing to reduce her resistance and to protect her internal bags from variations of temperature, due to radiant heat, and from deterioration caused by sunlight.
3. The envelope of a non-rigid ship requires a combination of both properties.

Gas-tight Fabric.—The lightest method of rendering a fabric gas-tight is the application of goldbeater's skin. This material is a membrane which, although water will easily pass through it, has a very pronounced ability to resist the passage of hydrogen. The skins are obtained from the messentry of a cow, each animal contributing a piece which averages about 8 in. by 20 in. These skins are stuck to the fabric by means of glue or rubber solution, and are varnished to protect them against moisture and damage.

The gas-tightness of a non-rigid envelope is obtained by rubber proofing only. The same fabric has to fill the functions of outer cover, as stated above, and also has to withstand considerable stress produced by the internal pressure of the gas, and by the tension of the riggings attached to it.

In order to obtain the necessary strength—and more particularly strength to resist tearing—a number of plys of cotton fabric are stuck together with layers of rubber solution between them. Fabric for small size ships can be given the required strength by two plys of cotton, the inner one being diagonal. Stronger fabric is usually made of three plys, the middle of the three being diagonal. The diagonal ply is formed by cutting strips of fabric and sticking them to the other ply so that their threads run at 45 deg. to the threads of the main ply, and to the length of the built-up strip of fabric. These diagonal threads have a very pronounced effect in distributing a stress evenly over threads of the main ply.

The rubber is made into a thick solution and spread by a kind of scraping knife on to the layers of fabric before they are stuck together.



One of the Slides which illustrated the Lecture. A non-rigid Airship buckling owing to reduction of pressure. No damage resulted.

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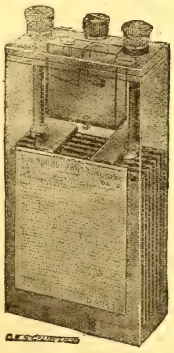
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The rubber on the outer surface usually contains aluminium powder, as this forms a surface that reflects much of the radiant heat, thus preventing rapid temperature change, and is also opaque to the light which would injure the fabric inside. It is usually found that the outer layer of proofing has perished so badly as to be easily noticeable before the strength of the fabric has become appreciably reduced by weathering.

Outer Cover Fabric.—Outer cover fabrics generally resemble the fabric used on aeroplane wings. It is necessary that after the outer cover is placed on the ship a certain degree of contraction should take place in order that the cover may be well tensioned to resist any tendency to flap.

Engine Requirements.

Our very extensive experience of airship flying, extending over nearly 3,000,000 miles during the war, has shown that by far the most fruitful cause of failure is connected with the engines. This is the case although a large proportion of the small difficulties which occur in aero engines are of a type which can be made good in an airship, but not in an aeroplane. The length of time for which an airship's engine is running continuously is very considerably greater than that of an aeroplane. The requirements to be expected from a good airship engine therefore differ from those of an aeroplane engine in several important respects:—

1. The engine must be suitable for running for very long periods without breakdown.
2. All gear on the engine must be arranged so that small defects can be made good in the air, the engine, if necessary, being stopped for a short period.
3. The fuel and oil economy, more particularly at reduced powers, are of far greater importance to an airship than is the initial weight of the machinery.

Useful Carrying Capacity.

The carrying capacity of an airship is perhaps the feature of greatest importance both from a Service and commercial point of view. The weight which is available for bombs, passengers, merchandise, or fuel, depends upon the volume of gas contained by the ship and upon the weight of the ship's structure and all necessary parts. The volume of gas will increase as the cube of the linear dimensions of the ship, and it will be readily understood that the weight of the ship will not increase as such a high power. This indicates that as the size of the ship increases the proportion of her gross lift which is available for lifting capacity will also increase.

The non-rigid ship having no hull structure will for the same size have a considerably greater proportion of available lift. It may be assumed that it is at the present time practicable to design both a rigid ship and a non-rigid ship which will be able to carry as useful load a weight equal to that of the ship, i.e., 50 per cent. of the gross lift of the ship will be available for useful purposes. The size of a non-rigid which will give this ratio is approximately 500,000 cubic feet, and for a rigid approximately two million cubic feet.

For many commercial purposes there is much to be gained by carrying a given weight in several small ships rather than in one large one. For naval purposes, when the airship is used as a cruiser, her function is to carry observers and a W.T. installation for a certain distance at a certain speed, and a ship that will do this with a small crew is as effective as one with a big one. To this it must be added that the small ship can get away on a large proportion of the days when the larger ship would be weather-bound. The best figures which are available as regards the cost of our largest rigid and non-rigid indicate that some six of the non-rigids referred to above could be built for the same price as the equivalent rigid referred to.

An airship which is making a long passage extending over several days has to contend with difficulties due to changes of temperature.

The change of temperature, and more particularly the change in the amount of radiant heat by day and night, is often very great. Let us trace the history of a ship which leaves the ground in the early morning before sunrise.

As the day advances she warms up and her lift will probably increase, due to superheat and the petrol she has burnt. Unless she is prepared to keep herself down by using her elevators and flying nose down, she must rise and lose gas. Later in the day, when the superheat disappears, the ship may become seriously heavy due to the amount of gas she has lost. It is important, therefore, to reduce the gas lost, and this can best be done by avoiding the necessity of allowing the ship to go to a considerable height. For this it is necessary to take weight into the ship. This can be done by picking up water from the sea or by condensing the steam formed in the engine exhaust.

The first method is only possible over the sea and by coming down to a low height. It even then presents considerable difficulty. There is, however, the advantage that a large weight of water can be picked up quickly when required. The weight of water that can be condensed from the exhaust is theoretically more than 20 per cent. in excess of the corresponding weight of fuel burnt, but it is found in practice that to collect more than about 80 per cent. of the petrol weight would necessitate very heavy condensers.

Types of Airships Developed During the War.

(A number of slides were projected on the screen to show the gradual development of the present classes of British airships from the beginning of 1915, when, as the lecturer stated, the interest in airships was revived by Lord Fisher's decision that they might be made to form an important defence against the submarine. The first "S.S." ship was constructed by suspending a "B.E." aeroplane, stripped of its wings and tail, under a suitable small envelope).

The trials of the first ship were made in less than 20 days from the time the instructions to proceed were received. The first flights were so satisfactory that the Admiralty gave instructions that the production of these ships was to proceed at once.

A few cars of the "pusher" type which generally resembled the nacelle of a Maurice Farman, were constructed by a private firm, but although they relieved the pilot of the propeller slipstream, they did not prove as satisfactory as the older "B.E." type.

It soon became necessary to construct a ship of larger size and capable of lifting a greater load and of longer endurance. An envelope of the "Astra" type was obtained from a ship which had been built before the war as a Belgian millionaire's air yacht. A suitable car to take four men was constructed and rigged below it. This, again, proved a satisfactory preliminary experiment and was the beginning of the "Coastal" type. The envelope had to be re-designed, but the modifications made to the car were comparatively small. This class of ship was modified in 1918 to the type known as "C*" which had again a better shaped envelope and slightly better crew accommodation in the car

The Zero Type of Car.

The requirements for the "S.S." ship altered somewhat, and it became desirable that the ship should be capable of landing on the water and also suitable for being towed from a seagoing ship. For this purpose the "Zero" type of car was designed and constructed at the Airship Patrol Station near Dover. No alteration of any importance was, however, made to the envelope.

A ship larger again than the "Coastal" was found to be required for extended cruising in the North Sea and for work with the Fleet, and the "N.S." ship was therefore designed. She marks a distinct departure from the earlier classes. Her machinery is in a unit quite separate from the main car, which latter only carries the crew and navigating party.

Airship Handling.

In many cases wind screens have been erected in order to break the force of a wind across the mouth of the shed, but it appears very probable that the unsteady flow produced by these screens renders the ship more difficult to handle than she would be if no screens at all were provided. In order to decrease the disturbance caused by these screens certain of them have been constructed with large gaps left at intervals, and others have been covered with expanded metal instead of corrugated sheeting. Both these devices tend very greatly to reduce the eddies formed by the screens.

Present opinion appears to incline to a complete absence of wind screens and the provision of side rails and travellers to which the guys of the ship can be attached. The difficulty of taking ships into their sheds must not, however, be unduly magnified. Ships working at patrol stations have frequently been taken into their sheds in winds of 35 m.p.h. Winds such as this would, of course cause considerable risk to a rigid ship of the largest type.

Mooring.

Shortage of materials and the delays in shed construction rendered it necessary that in order to provide the great increase of airship bases required for the anti-submarine campaign, temporary arrangements should be made for mooring out the smaller airships. A very satisfactory means of arranging this was found by selecting suitable woods and cutting in them alleys leading up to small cleared spaces in which airships could be secured and protected from the wind by the trees. As long as trees of sufficient height were available it was found that this system proved most satisfactory, and many small mooring-out camps were established and satisfactorily protected their ships against winds of over 60 m.p.h.

Towing.

The first towing experiment was carried out in 1912 when one airship broke down and was towed home by another. The towing ship landed alongside the disabled one and a wire was taken from her to a suitable point on the latter The ships then rose and no difficulty was experienced in the towing operations. This operation in itself has not been used since, but it offers attractive possibilities for conveying large weights of material at a comparatively slow speed when the airship tug may tow a number of air barges after her.

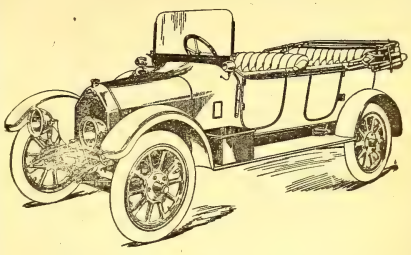
I have tried to crowd into one evening what really requires many very carefully prepared lectures to give a reasonably correct impression of the work which has been done even during the war. You must only, therefore, regard this lecture as a peep into airship engineering, a science which those who have experience of it realise to be at least as complex and involved, but also to have at least as great possibilities, as the corresponding aeroplane work.

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FROM THE "LONDON GAZETTE."

AIR MINISTRY, MARCH 25TH

R.A.F.—The following temp. appointments are made at the Air Ministry :—Staff Officer, 1st Cl.—(T.)—Maj. F. V. H. Mackenzie, and to be actg. Lt.-Col. while so employed, from Nov. 1st, 1918, to Jan. 31st.

Staff Officer, 3rd Cl.—(T.)—Capt. W. T. Hill, from Nov. 1st, 1918, to Feb. 4th.

The following temp. appointment is made :—Staff Officer, 3rd Cl.—(T.) —Capt. S. F. Ingram, Feb. 24th (T.).—The date of appointment of Lt. A. Graham is July 10th, 1918, and not as stated on page 516 of the "Gazette," of Jan. 10th (substituted for notification in "Gazette," March 14th).

FLYING BRANCH.—Capt. H. D. Williams, M.C., to be actg. Maj. while empld. as Maj. (A.), Oct. 1st, 1918.

Lt. L. H. McRobert to be Lt. (A.), from (O.), July 26th, 1918.

Sec. Lt. (Hon. Lt.) R. N. Haile to be Lt., Jan. 1st.

The following are granted temp. commns. as Sec. Lts. (O.) :—J. Montgomery (Lt., R. Sc. Fus., T.F.), and to be hon. Lt. (substituted for notification in "Gazette," Dec. 17th, 1918); J. Topping (temp. Sec. Lt., K. Highrs.) (since missing, believed killed), Aug. 8th, 1918; A. C. Taylor (Lt., Ont. R., C.E.F.), Oct. 15th, 1918, and to be Hon. Lt.; R. H. Skinner (Sec. Lt., R.F.A., Spec. Res.), Nov. 16th, 1918 (substituted for notification in "Gazette," Dec. 10th, 1918).

The following Sec. Lts. (late Gen. Lists, R.F.C.), are confirmed in their rank as Sec. Lts. (O.) :—P. Kemp, April 25th, 1918; W. E. Hall, Aug. 7th, 1918.

The following relinquish their commns. on ceasing to be empld. :—Sec. Lt. C. B. Clark (Lt., E. Ont. R.), Dec. 7th, 1918; Lt. A. C. Dean (Lt., C. Ont. R.), Jan. 2nd; Lt. J. D. Boyd (Lt., B. Col. R.), Jan. 6th; Sec. Lt. (Hon. Lt.) R. T. Smith (Lt., C. Ont. R.), Jan. 14th; Lt. H. E. Roxburgh (Lt., R.F.A.), Feb. 3rd; Lt. F. C. Sawyer (Lt., Lab. R., York R.), Feb. 12th; Lt. R. V. Hamilton (Lt., R. War. R.), Lt. (Hon. Maj.) A. Clear (Maj., Manchester R.), Feb 17th; Sec. Lt. (Hon. Lt. E. Cropper (Lt., Alb. R.), Feb. 24th; Lt. N. F. McKela (Lt., Alb. R.), Feb. 25th; Lt. (Hon. Capt.) G. B. Davies (Capt., Alb. R.), March 3rd; Lt. S. J. Wills (Lt., Northants. R.), March 10th; Lt. E. Alder (Lt., Manitoba R.), March 12th; Lt. (actg. Capt.) H. Axford, D.F.C. (Lt., Manitoba R.), March 15th.

The following are transferred to unempld. list :—Lt. C. H. Sharp, Jan. 9th; Lt. G. Cornwall, Jan. 10th; Lt. (actg. Capt.) A. L. Harrow-Bunn, M.C., Jan. 11th; Sec. Lt. G. E. N. McLeod, Jan. 19th; Lt. M. L. James, Jan. 20th; Sec. Lt. D. B. Thomson, Jan. 22nd; Sec. Lt. R. L. Pallett, Jan. 23rd; Sec. Lt. (Hon. Lt.) J. S. Hunter (Lond. R., T.F.), Jan. 24th; Sec. Lt. E. J. E. Topham, Jan. 25th, Sec. Lt. A. Anderson, Sec. Lt. H. R. Tyler, Jan. 26th; Lt. C. H. Jenkinson, Jan. 27th; Sec. Lt. F. D. Gregory, Sec. Lt. R. J. Jones, Lt. R. A. Simson, Jan. 28th; Capt. (actg. Maj.) K. F. Bailmain, Sec. Lt. R. S. Farmer, Jan. 29th; Lt. (Hon. Capt.) R. H. Hawkins (S. Staffs. R.), Lt. J. J. Lister, Lt. A. B. Ollerenshaw, Sec. Lt. D. Oxley, Jan. 31st; Sec. Lt. J. Clark, Lt. S. H. B. Emms, Lt. J. E. S. Jones (North'n R.), Sec. Lt. R. Miller, Feb. 1st; Lt. J. Barker, Feb. 2nd; Lt. J. Bennett, M.C., Lt. H. K. Budgen, Lt. F. Fowler, Feb. 3rd; Sec. Lt. A. V. W. Church, Lt. D. MacTavish (Cam. Highrs., T.F.), Lt. J. McL. Pearson (Sco Rif., T.F.), Feb. 4th; Sec. Lt. H. C. Charnley, Lt. S. L. Hooper (E. West. Ind. R.), Lt. R. V. Jameson, Feb. 5th; Sec. Lt. P. H. Fowler, Sec. Lt. (Hon. Lt.) W. B. Ivens, Capt. L. Prideaux, Sec. Lt. J. C. Napier, Feb. 6th; Lt. C. G. S. Jones-Evans, D.F.C., Sec. Lt. A. W. Glover, Lt. A. H. Phillips, M.C. (Ox. and Bucks. L.I.), Feb. 7th; Sec. Lt. J. K. McGregor, Lt. R. G. B. Nixon, Sec. Lt. F. C. Randall, Sec. Lt. J. L. Tait, Sec. Lt. C. E. Trippe, Feb. 10th; Sec. Lt. C. E. Goddard, Lt. (actg. Capt.) W. D. Tarrier, Lt. W. T. Pearson, Feb. 11th; Lt. T. Kidd, Lt. H. Walter, Feb. 12th; Sec. Lt. G. H. Ellingham, Capt. G. W. Gathergood, Sec. Lt. R. E. E. Hassell, Feb. 13th; Lt. M. E. Draper, Sec. Lt. H. T. Ebbutt, Sec. Lt. P. J. Gernsbacher, Lt. N. R. Harden, D.F.C., Lt. H. R. Moore, Lt. H. G. Wildbore, Feb. 14th; Lt. E. C. Davies, M.C., Sec. Lt. A. Maclaren, Lt. W. A. Windsor, Feb. 15th; Sec. Lt. W. Heaud, Feb. 16th; Sec. Lt. L. E. Jones, Feb. 17th; Lt. A. L. Davies, Lt. M. Lewis, Feb. 18th; Lt. C. F. G. Doran, Lt. G. S. French (Cam. R.), Lt. W. B. Higgins, Sec. Lt. J. W. Longland, Lt. A. E. Watkins, Feb. 19th; Sec. Lt. N. T. Brown, Lt. J. F. Downing, Sec. Lt. A. W. Hardwick, Sec. Lt. W. Hawkin (York. L.I., T.F.), Sec. Lt. L. H. Nesbitt, Sec. Lt. C. R. Pickering, Feb. 20th; Capt. A. Adamson, Lt. D. R. Davies, Sec. Lt. T. J. Egan (Mun. Fus.), Lt. P. McAllen, Sec. Lt. R. K. Mackenzie, Lt. R. T. Williams, Feb. 21st; Sec. Lt. P. K. Homer, Sec. Lt. R. B. Wimbush, Feb. 22nd; Sec. Lt. G. B. Moore, M.C., Sec. Lt. L. C. Webb, Feb. 23rd; Sec. Lt. K. R. Goodacre, Capt. W. E. Grosset (Hugh. Cyc. B., T.F.), Lt. A. C. Pepper, Feb. 24th; Sec. Lt. D. Boe, Lt. F. H. Clarke (R.G.A., Spec. Res.), Lt. H. W. Frith, Sec. Lt. G. A. Harris, Sec. Lt. C. G. Nettleton, Sec. Lt. G. B. Pike, Feb. 25th, Sec. Lt. L. C. Baker, Sec. Lt. C. V. Carr (W. Rid. R., T.F.), Sec. Lt. W. R. T. Chamberlain, Sec. Lt. H. Lancaster, Lt. W. Lauces, K., T.F.), Lt. A. Macdonald, Sec. Lt. J. G. B. McMillan, Sec. Lt. P. W. Paget, Feb. 26th; Lt. H. C. Fulcher (R.E., T.F.), Lt. H. B. Hartland, Sec. Lt. A. Tytler, Lt. A. C. Tremellen, Feb. 27th; Sec. Lt. H. S. Basford, Sec. Lt. F. E. Dawe, Sec. Lt. W. Y. Gothorp, Lt. B. H. McCormack, Sec. Lt. (Hon. Lt.) J. B. McCowan (Cam. R., T.F.), Sec. Lt. E. S. Sage, Feb. 28th; Lt. (actg. Capt.) F. Grosset (High. Cyc. B.), Lt. D. B. Hartle, Sec. Lt. A. F. Quitenden, Lt. A. F. Stokes, Capt. R. R. Thornley, D.S.C., March 1st; Sec. Lt. R. F. B. Caukwell, Sec. Lt. E. L. Goulder, Lt. R. Lang, Lt. S. B. Reece, Lt. C. G. Shaumer (Lond. R., T.F.), March 2nd; Sec. Lt. G. R. Hodgkison, Sec. Lt. J. Linnsden, March 3rd; Sec. Lt. J. Arnold (L'pool R.), Lt. (actg. Capt.) W. R. Balden, Sec. Lt. R. Bardsley, Sec. Lt. G. Highton, Lt. R. J. Paterson (Hants. R.), March 4th; Capt. A. F. Davis (Suff. R.), Lt. A. G. Fleming (Sco. Rif.), Lt. A. I. Orr-Ewing (Berks. Yeo.), Maj. P. W. Smith (R.A., T.F.), March 5th; Maj. L. S. Breadner, Sec. Lt. E. P. Clarey, Lt. A. H. Crumpp, Sec. Lt. A. W. Cain, Lt. A. T. W. Goldsmith, Lt. F. W. Goodman, Sec. Lt. G. W. Goodwin, Sec. Lt. R. C. Hardy, Sec. Lt. W. B. Hargreaves (R. Lanc. R.), Sec. Lt. F. W. Hicks (Lond. R., T.F.), Sec. Lt. G. D. Lane, Sec. Lt. C. Wise, March 6th; Sec. Lt. H. Bagshaw, Sec. Lt. R. C. Ernett, Sec. Lt. E. C. Farmer, Lt. (actg. Capt.) F. W. Gillett, D.F.C., Sec. Lt. W. A. L. Glover, Sec. Lt. W. Hewitt, Lt. W. F. Hendershot, Sec. Lt. E. C. Hill-Clark, Lt. E. W. Pritchard, Lt. W. V. Radford, Sec. Lt. H. W. Wallace, Sec. Lt. H. A. Williams, March 7th; Sec. Lt. J. Baillie, Lt. J. N. Dugdale, Lt. R. J. Eccles, Sec. Lt. W. H. Gann, Sec. Lt. H. E. Grove, Sec. Lt. A. W. Grant, Sec. Lt. J. Gallacher, Sec. Lt. (Hon. Lt.) W. D. Hamilton, Lt. (actg. Capt.) R. McLaughlin, D.F.C., Sec. Lt. (Hon. Lt.) W. A. Macmillan (R.G.A., T.F.), Lt. T. T. Taylor, Sec. Lt. E. N. A. Vincent, March 8th; Sec. Lt. V. B. Bedell, Sec. Lt. E. R. Bull, Capt. L. N. Glaisby, D.S.C., Lt. H. Greene, Lt. (actg. Capt.) C. H. R. Lagesse, D.F.C., Sec. Lt. P. W. Lynch-Blosse, Lt. V. I. Oliver, March 9th; Lt. S. A. Gomez, Dep. R.), March 10th; Sec. Lt. C. A. Allenby, Lt. P. Blairman, Lt. B. C. Cockwin, Sec. Lt. R. J. Evans, Sec. Lt. C. W. Frasier, Capt. D. Gill, Sec. Lt. W. Learmouth, Sec. Lt. H. M. Kettener, Lt. H. Lingard, Sec. Lt. (Hon. Capt.) H. A. Porter (R.G.A., T.F.), Lt. (actg. Capt.) E. J. Smethan-Jones, Capt. L. R. Warren, Lt. T. F. York, March 1st; Lt. N. J. Brewer, Lt. L. Cozens, A.F.C., Sec. Lt. D. A. Conney, Lt. L. G. Barnett, Lt. F. T. Ginn, Sec. Lt. J. E. Hammond, Lt. J. E. R. Harwood, Lt. G. Hodgson, Sec. Lt. L. G. Lucas, Sec. Lt. S. L. McKillen, Lt. M. P. McLeod, Sec. Lt. A. C. J. Payne, M.M., Sec. Lt. S. Perkins, Lt. C. P. Ranger, Lt. S. T. H. Roberts, Capt. N. E. Stirling, Sec. Lt. F. A. Taylor, Lt. W. H. Valentine, Capt. A. F. Whealy, March 12th; Capt. L. F. E. King, D.F.C., Lt. F. R. Mangham, Sec. Lt. J. B. Nelson, Sec. Lt. W. S. Swann, Sec. Lt. J. H. C. Wake, March 13th; Sec. Lt. (Hon. Capt.) C. E. Bowden (D.C.L.I., T.F.), Lt. G. J. Gumyon, Sec. Lt. W. N. Scott, Sec. Lt. C. P. Sparkes, Lt. H. A. Vinceberg, Sec. Lt. J. W. Watkins, Capt. J. S. Webb, Sec. Lt. S. C. Worrall, March 14th; Capt. D. C. Bell, M.C. (Middx. R., T.F.), Sec. Lt. W. C. Benson, Sec. Lt. F. S. Gordon, Lt. D. W. MacIntosh (Cam. Highrs.), Lt. G. H. Palmer, Sec. Lt. J. S. K. Warren, March 15th; Capt. E. P. Hicks, Lt. D. F. Woodford, March 16th; Lt. J. T. C. Gray, March 18th.

The following relinquish their commns. on account of ill-health and are permitted to retain their rank :—H. W. Arnott (contracted on active service), Lt. F. Francis, March 26th

Lt. C. J. Wilsdon relinquishes his commn. on account of ill-health (caused by wounds), March 26th.

The following relinquish their commns on account of ill-health and are permitted to retain their rank :—H. Bridger, H. B. Hewat (contracted on active service), B. W. Weight, March 26th.

Sec. Lt. M. P. La. Fleur relinquishes his commn. on account of ill-health, March 26th.

Sec. Lt. A. Pascella relinquishes his commn., being physically unsuited for the duties of Pilot or Observer; March 26th (substituted for notification in "Gazette," Nov. 5th, 1918).

The Christian names of Sec. Lt. George Egerton Stuart McLeod are as now described, and not as stated in the "Gazette," June 14th, 1918.

The surname of Sec. Lt. H. Oates is as now described, and not Gates as stated in "Gazette," Nov. 22nd, 1918

The surname of Lt. N. C. Ashton is as now described and not as stated in the "Gazette," Dec. 31st, 1918.

The surname of Sec. Lt. A. E. Browne is as now described, and not as stated in the "Gazette," Jan. 14th.

The initials of Lt. (actg. Capt.) L. C. Pockney are as now described, and not as stated in the "Gazette," Feb. 28th.

The notification in the "Gazette," Feb 14th, concerning Lt. R. W. Jackson is cancelled.

ADJUTANTS-GENERAL'S BRANCH.—Capt. H. O'N. de H. Segrave to be Capt from (S.O.), Dec. 13th, 1918.

Lts. to be actg. Capts. whilst empld. as Capts. :—A. B. Monk, Dec. 30th, 1918; R. C. Vaughan, M.C., March 6th.

Lts. (A.) to be Lts. :—J. K. Line, Nov. 18th, 1918; C. G. Evans, Dec. 14th, 1918; L. Wade, Dec. 20th, 1918; A. Growell, Jan. 6th; M. S. C. Gordon, Jan. 7th; W. H. Gibson, Jan. 17th, O. D. Hay, Jan. 25th; C. Parkinson, Jan. 27th; (Hon Capt.) J. E. A. O'Dwyer, Jan. 30th; F. C. Rider, Feb. 3rd; O. Pearson, Feb. 10th; E. T. McC. Routledge, Feb. 11th, (Actg. Capt.) J. R. Tait, Feb. 10th, and relinquishes the actg. rank of Capt., March 6th; T. Kidd, March 6th.

Lts. (K.B.) to be Lts. :—A. G. Bullock, Oct. 25th, 1918; E. F. Jones, Nov. 29th, 1918; G. T. Dunstan, Dec. 11th, 1918; (Hon. Capt.) B. B. Bishop, Jan. 24th; (Hon. Capt.) N. R. Mossop, Feb. 6th; B. Thomas, Feb. 7th.

Lts. (O.) to be Lts. :—R. C. Jones, Nov. 25th, 1918; W. D. Jeans, Dec. 2nd, 1918; M. V. Stewart, Dec. 6th, 1918; E. C. Batchelor, M.C., Dec. 18th, 1918; R. W. Peat, Dec. 30th, 1918; S. F. Thompson, Jan. 7th; A. S. Hibbs, Jan. 30th.

Lt. T. S. Cowperthwaite to be Lt., from A.P. (T.), March 16th.

Sec. Lt. A. W. Smith to be Lt., April 2nd, 1918.

Sec. Lts. to be Sec. Lts., from (A.) :—E. N. Allott, Dec. 6th, 1918; A. Brufton, Dec. 18th, 1918; F. D. Butcher, Dec. 30th, 1918; T. K. Bentley, Jan. 3rd; F. F. Anslow, Jan. 10th; H. P. Bell, Jan 15th; (Hon. Lt.) L. A. W. Knight, Jan. 16th, and to be Hon. Lt.; A. J. Bloom, Feb. 7th; T. Fraser, Feb. 10th; (Capt.) W. P. Thompson, and to be Hon. Capt., Feb. 10th; A. A. S. Milne, Feb. 17th; E. J. Lainchbury, Feb. 19th; H. Townley, Feb. 22nd.

Sec. Lts. to be Sec. Lts., from (A. and S.) :—(Hon. Lt.) R. J. V. Pulleriaft, Dec. 31st, 1918, and to be Hon. Lt.; G. J. Dickins, Jan. 8th; H. R. Cooke, Jan. 14th; J. Wright, March 6th.

Sec. Lts. to be Sec. Lts., from (R.B.) :—J. H. Gray, Jan. 3rd; F. M. Hawthorn, H. W. Goss, Jan. 15th; A. E. Hopkins, Jan 31st

Sec. Lts. to be Sec. Lts., from (O.) :—W. H. Gardner, Nov. 21st, 1918; F. F. Crump, Dec. 3rd, 1918; F. Warham, Dec. 6th, 1918; W. Brown, Dec. 14th, 1918; (Hon. Lt.) T. Mitchell, Jan. 15th, and to be Hon. Lt.; F. Heath, Jan. 18th; T. Newey, H. S. Mullen, Jan. 21st; (Hon. Lt.) W. L. Kendrick, and to be Hon. Lt., S. Dennis, Jan. 27th; C. W. Newstead, Jan. 30th; A. Johnson, Jan. 31st; N. Butt, Feb. 3rd; L. J. Skinner, Feb. 6th; (Hon. Capt.) S. C. Bulteel, Feb. 7th, and to be Hon. Capt.; H. S. Jeppe, Feb. 10th; E. C. Heyne, Feb. 11th; A. B. Bennett, Feb. 12th; G. C. Russell, Feb. 15th; L. F. Rowsell, W. Cowden, J. N. T. Spence, Feb. 17th; P. J. Holmes, Feb. 18th.

Sec. Lt. A. J. Somers to be Sec. Lt., from (T.), Feb. 24th.

The following Sec. Lts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lts. :—J. Earle-Wilson, April 1st, 1918; H. Kaye, Aug. 31st, 1918.

The following relinquish their commns. on ceasing to be empld. :—Capt. E. V. Noel (Capt., Loud. R.), Feb. 13th; Sec. Lt. J. Miller (temp Sec. Lt., D.L.I.), Feb. 21st.

The following are transferred to unempld. list :—Sec. Lt. E. J. Sayer, Jan. 9th; Sec. Lt. A. V. Branson, Feb. 4th; Lt. (actg. Capt.) G. S. D. Pape, Feb. 5th; Capt. A. B. Knox-Fisher (Lond. R.); Sec. Lt. J. G. Paterson, Feb. 7th; Sec. Lt. A. Turnbull, Feb. 11th; Sec. Lt. J. Douglas, Sec. Lt. W. Druce, Sec. Lt. C. H. Hundy, Feb. 18th; Lt. F. R. Haggie,

Feb. 23rd; Sec. Lt. A. Henderson, Feb. 22nd; Sec. Lt. L. Greatbach, Feb. 24th; Sec. Lt. R. F. Houston, Feb. 26th; Lt. A. W. Robinson (E. Surr. R.), Feb. 27th; Lt. H. N. Giles, Sec. Lt. F. L. Howard, Capt. A. P. A. Larking, Feb. 28th, Sec. Lt. H. B. Elbourne, Maj. W. C. Grant, Lt. H. W. Liversidge, March 1st; Sec. Lt. F. H. Blaxhill; Sec. Lt. F. A. Dinsdale, Sec. Lt. D. J. Evans, Lt. C. Green, Sec. Lt. C. G. Smith, March 2nd; Lt. (Hon. Capt.) (actg. Capt.) S. C. P. Bacon, Lt. K. L. Bulkley (Hants. R., T.F.), Capt. S. J. Smith, March 2nd; Lt. C. Guthrie, Lt. G. T. Learmond (Cav.), March 5th; Sec. Lt. P. F. Ellisdon. Lt. (actg. Capt.) P. C. Hollingsworth, M.C., Lt. A. J. Lucas, Sec. Lt. H. M. Lonsdale, March 6th; Sec. Lt. E. H. Ades, Sec. Lt. T. C. Holloway, March 7th; Capt. W. W. Lendon (Lond. R., T.F.), March 8th; Sec. Lt. R. F. H. Brown, Sec. Lt. M. W. Benham, Sec. Lt. C. R. Jones, Sec. Lt. A. H. Tilbury, March 11th; Lt. M. Besso (Man. R., T.F.), Sec. Lt. N. C. Raffin, Lt. R. S. Rudd, March 14th; Lt. W. G. Hurrell, D.F.C., Lt. J. B. Low (I.L.I.), March 16th.

Capt. J. F. Kerr relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain his rank, March 26th.

Capt. H. V. Rose is removed the Service, his Majesty having no further use of his services as an officer, March 26th.

The notification in "Gazette," Jan. 24th, concerning Sec. Lt. S. Stevens is cancelled.

The notification in "Gazette," Feb. 4th, concerning Lt. L. T. Lewis is cancelled.

The notification in "Gazette," Feb. 14th, concerning Lt. (Hon. Capt.) S. Snow, M.C., is cancelled.

TECHNICAL BRANCH.—Lt. H. R. Stewart to be Lt. (Grade A), from (O.), May 26th, 1916 (substituted for notification in "Gazette," Feb. 21st).

Lt. E. T. Molyneaux to be Lt. (Grade B), from A.), Jan. 14th.

R. F. Gosnell (Capt., H.A.C.) is granted a temp. commn. at Lt. (Grade A), scns. April 1st, 1918, and to be Hon. Capt., Aug. 5th, 1918.

Sec. Lts. to be Lts., without pay and allowances of that rank:—H. E. Taber, March 1st; P. Lodge, March 8th.

Sec. Lt. F. R. Williams to be Sec. Lt. (Grade A), from (Grade B), Feb. 21st.

Sec. Lt. H. F. Hickey to be Sec. Lt. (Grade B), from (A.D.), March 10th.

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. A. Campbell (Lt., Suss. R., T.F.), Nov. 28th, 1918; Lt. (actg. Capt.) H. W. Brooks (Lt., York and Lanc. R.), Feb. 14th.

The following are transferred to unempld. list:—Sec. Lt. (actg. Lt.) E. W. M. Tomlinson, Jan. 14th; Sec. Lt. (Hon. Lt.) (actg. Lt.) E. G. Seth-Smith (E. Surr. R.), Feb. 2nd; Lt. A. Dobson, Feb. 4th; Lt. P. G. Edmonds, Capt. J. S. Reid, Feb. 8th; Sec. Lt. (Hon. Lt.) E. R. Parsons (R.G.A., T.F.), Feb. 14th; Lt. A. Henderson (R. Sco., T.F.), Lt. H. Smith, Feb. 19th; Sec. Lt. E. H. Harrison, Feb. 20th; Sec. Lt. (actg. Capt.) H. E. Haddon, Feb. 21st; Sec. Lt. (actg. Lt.) H. F. Wilkins, Lt. R. F. Wood, Feb. 22nd; Lt. C. R. Lloyd (E. Kent R., T.F.), Sec. Lt. H. S. Wood, Feb. 25th; Capt. L. J. Jones (Lond. R., T.F.), Sec. Lt. P. Reynolds, Feb. 26th; Sec. Lt. (actg. Lt.) R. J. Tallyn, Feb. 27th; Sec. Lt. S. Calam, Sec. Lt. A. Haigh, Sec. Lt. H. Stuart, March 2nd; Sec. Lt. R. M. Balston, March 3rd; Sec. Lt. E. T. Fountain, (actg. Capt.) H. E. Hotchin, Lt. E. Turner (Manch. R.), March 4th; Lt.-Col. T. B. Barrington, Sec. Lt. W. W. Fyfe, Lt. T. B. Glover, Lt. H. W. Wolverson, March 5th; Lt. C. M. Benjamin, Sec. Lt. J. A. Edge, Sec. Lt. W. H. P. Parker, March 7th; Sec. Lt. A. J. Kurn, Sec. Lt. R. U. Nash-Taylor, Capt. W. F. Prentice, M.B.E., Lt. P. S. Taylor, Sec. Lt. A. Wall, March 8th; Sec. Lt. J. A. Cundy, Lt. H. Partridge, Sec. Lt. W. L. Pike, M.C., March 11th; Sec. Lt. E. G. P. Hopkins, Sec. Lt. J. A. Moore, Capt. T. O. C. Pease, Maj. J. O. Ruscoe, March 12th; Sec. Lt. C. G. Massey-Dawson, March 13th; Sec. Lt. (Hon. Lt.) R. D. Wakeham, March 14th; Sec. Lt. R. I. Croucher, March 15th; Capt. C. W. Alexander, March 17th; Lt.-Col. S. E. Smith, O.B.E. (Glouc. R.), March 18th.

Lt.-Col. H. B. Nutting relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, March 26th.

Lt. T. J. Stannage relinquishes his commn. on account of ill-health, and is permitted to retain his rank, March 26th.

Sec. Lt. J. F. Haworth relinquishes his commn. on account of ill-health, and is permitted to retain his rank, March 26th.

The Christian names of Lt. (actg. Capt.) Joseph Arthur Atkinson are now as described, and not John Abbott, as stated in "Gazette," Feb. 21th.

The initials of Sec. Lt. C. T. Parker are as now described, and not as stated in "Gazette," Feb. 25th.

MEDICAL BRANCH.—Col. Dreyer (temp. Hon. Lt.-Col., R.A.M.C.) is granted a temp. commn. as Hon. Lt.-Col., Oct. 2nd, 1918, with seny. from April 1st, 1918.

The following are transferred to unempld. list:—Lt. P. M. Roberts, Feb. 13th; Capt. A. MacLennan (R.A.M.C., T.F.), Feb. 21st; Lt. L. C. W. Balls, Feb. 23rd; Lt. J. J. Savage, March 15th.

The notification in "Gazette," Feb. 24th, concerning Capt. L. G. Davys is cancelled.

PHYSICAL TRAINING BRANCH.—Lt. (actg. Capt.) L. E. Gording, M.C., retains the actg. rank of Capt. whilst empld. as Asst Superintendent of Gymnasia, from (Ad.), Dec. 3rd, 1918.

MEMORANDA.—F. H. Bramwell is granted a temp. hon. commn. as Maj., April 1st, 1918.

Dattabraya Laxuman Patwardhan is granted a temp. hon. commn. as Sec. Lt., March 15th.

The following Hon. Lts. relinquish their commns. on ceasing to be empld.:—Actg. Hon. Capt. F. Gay, C. J. Grierson, Feb. 16th.

Hon. Capt. (actg. Hon. Maj.) B. Halford relinquishes his commn. on ceasing to be empld., Feb. 24th.

The following are transferred to unempld. list, from (S.O.):—Capt. N. F. W. Rookey, Jan. 21st; Lt. H. S. Rogers, Feb. 2nd; Lt. (actg. Capt.) R. F. Lamb, Feb. 12th; Lt. H. S. Morris, (C. Gds., Spec. Res.), Feb. 22nd; Capt. (actg. Maj.) F. C. Buck, Lt. H. W. Hern, March 1st; Capt. C. G. Jones, March 4th; Sec. Lt. (actg. Lt.) R. C. J. Hervey, March 5th; Capt. W. A. C. Dicketts, March 7th; Capt. H. M. Ryland, March 11th; Lt. F. R. Richardson, March 15th; Lt. (actg. Capt.) F. J. Cayley, March 17th.

Capt. E. Page (Lt., Midd. R.) relinquishes his commn. on account of ill-health, and is permitted to retain his rank, March 26th.

WAR OFFICE, March 27th

The names of the under mentioned have been brought to the notice of the Secretary of State for War for valuable services rendered in connection with the war, and, when applicable, an entry will be made in the records of service of officers and other ranks:—

Daniel, temp. Maj. R. M., R.G.A., now Maj. (actg. Col.) R.A.F.

COMMONWEALTH OF AUSTRALIA.

Cooper, Capt. W. J., Aust. F.C.

Harwell, Capt. L. T. W., Aust. F.C.

Matthews, Capt. G. C., Aust. F.C.

Matthews, Lt. R. O. C., Aust. F.C.

Tooth, Capt. E. N., Aust. F.C.

AIR MINISTRY, MARCH 28TH.

R.A.F.—The following temp. appointments are made:—Staff Officers, 3rd Cl.—And to be actg. Capts. whilst so empld.:—(P.).—Lt. S. F. Culver, Jan. 20th; (T.) Lt. B. D. Bellamy, March 18th.

FLYING BRANCH.—Maj. J. S. Scott, M.C., A.F.C., to be actg. Lt.-Col. whilst empld. as Lt.-Col. (A.), Sept. 1st, 1918.

Capt. H. A. Westendarp to be Maj., April 1st, 1918, and to take prec. next below Maj. E. L. Miller (substituted for notification in "Gazette," Feb. 14th).

Capt. L. R. Andrews to be actg. Maj. whilst empld. as Maj. (A.), Nov. 1st, 1918.

Capts. to be graded for purposes of pay as Capts. whilst empld. as Capts. (A.):—F. J. Vincent, April 1st, 1918; S. T. Freeman, Aug. 28th, 1918.

Capt. H. D. Hyde to be graded for purposes of pay as Capt. whilst empld. as Capt. (K.B.), Aug. 28th, 1918.

Lts. to be actg. Capts. whilst empld. as Capts. (A.):—E. L. Lister, May 1st, 1918; H. Wickett, D.F.C., Sept. 1st, 1918; K. G. Withers, Oct 1st, 1918; (Hon. Capt.) R. H. Fairbairn (C. Out. R.), Oct. 21st 1918.

Lts. to be actg. Capts. whilst empld. as Capts. (A. and S.):—C. Chrimes, D. F. Murray, D.F.C., Aug 1st, 1918; R. St. H. Clarke, Aug. 28th, 1918.

Lts. to be actg. Capts. whilst empld. as Capts. (K.B.):—A. M. Ross, July 13th, 1918; (Hon. Capt.) J. W. Walters, Aug 28th, 1918.

Sec. Lt. J. Macfarland to be actg. Capt. whilst empld. as Capt. (K.B.), July 13th, 1918

Lt. O. K. Gayford, D.F.C., to be actg. Capt. whilst empld. as Capt. (O.), April 1st, 1918.

Lt. T. E. Haslehurst to be Lt. (A.), from (T.), Sept. 23rd, 1918 (substituted for notification in "Gazette," Oct. 4th, 1918).

Lt. T. W. Kirkpatrick to be Lt. (O.), from (Ad.), Sept 5th, 1918.

Flt. Cadet 302208 G. A. Hooton is granted a temp. commn. as Sec. Lt. Obsr. Officer, Oct. 19th, 1918.

Lt. D. B. Cumming relinquishes his commn. on reversion T.A.R.O., Nov. 28th, 1918 (substituted for notification in "Gazette," Dec. 31st, 1918).

The following relinquish their commns. on ceasing to be empld.:—Lt. J. A. Anderson (Lt., B. Columb. R.), Feb. 28th; Lt. D. L. Burgess, M.C. (Lt., Sask. R.), Lt. (actg. Capt.) C. E. B. Corbould (Capt., W. Gal. R.), Lt. (Hon. Capt.) G. B. Davies (Capt., Alb. R.), Lt. (actg. Capt.) R. B. Sutherland (Capt., Can. Engrs.), March 3rd; Lt. A. A. Fraser (Capt., Manitoba R.), March 5th; Lt. H. S. Whiteside (Capt., W. Ont. R.), March 20th.

The following are transferred to unempld. list:—Sec. Lt. W. H. Abraham, Jan 2nd; Lt. J. Adam, Jan. 8th; Sec. Lt. R. W. Jones, Jan. 9th; Sec. Lt. (Hon. Lt.) R. W. Jackson, Jan. 13th; Sec. Lt. T. H. Walker, Jan. 14th; Lt. H. G. Frost, Jan. 15th; Sec. Lt. S. W. Jackson, Jan. 16th; Sec. Lt. A. A. Campbell, Lt. H. G. Mackintosh, Sec. Lt. H. H. Jackson, Lt. T. R. Scott, D.F.C., Jan. 17th; Lt. J. W. McKenzie, Sec. Lt. (Hon. Lt.) T. W. Moore, Sec. Lt. D. R. Morgan, Jan. 18th; Sec. Lt. L. W. Marchant, Jan. 20th; Sec. Lt. A. Cornforth, Lt. S. V. Cowell, Lt. Morgan, Jan. 21st; Lt. A. T. McKay, Lt. R. V. Sillars, Jan. 22nd; Sec. Lt. A. Arnott, Sec. Lt. J. McAuley, Jan. 23rd; Sec. Lt. F. J. Cotsell, Lt. (actg. Capt.) E. H. Marshall, Lt. T. C. Sanderson, Sec. Lt. A. C. Whitney, Jan. 24th, Lt. W. L. Davidson, Capt. A. M. Harding, Sec. Lt. W. Lowe, Sec. Lt. (Hon. Lt.) G. M. McGorrery, Sec. Lt. W. Nye, Jan. 25th; Capt. G. R. Marshall, Sec. Lt. R. Mayson, Sec. Lt. A. B. Meller, Sec. Lt. R. J. Siddall, Jan. 28th; Lt. (actg. Capt.) V. Beecroft, Lt. A. F. Kemp, Sec. Lt. A. A. Mound, Lt. J. E. G. Mosby, D.S.O., Sec. Lt. P. E. Richardson, Sec. Lt. J. C. Tyler, Jan. 29th; Lt. A. Blomfield, Lt. C. Calrow, Jan. 30th; Maj. (actg. Col.) H. L. Cooper, Lt. L. Jessop, D.F.C., Sec. Lt. F. T. Milton, Lt. G. F. Steel, Lt. F. R. Watkins, Lt. C. M. Watterson, Jan. 31st; Lt. T. Aitken, Lt. E. Bell, Lt. L. Childs, Sec. Lt. D. Davies, Sec. Lt. A. T. Dunlop, Capt. C. M. Down (Herts R.), Lt. S. C. Jackson, Sec. Lt. H. McColl, Sec. Lt. E. A. Simpson, D.F.C., Lt. L. B. Wallas, Feb. 1st; Lt. D. Alexander, Sec. Lt. W. Jan. 2nd; Lt. J. Kydd, Sec. Lt. S. A. Marden, Lt. W. C. Watson, Sec. Lt. L. F. J. Wall, Sec. Lt. J. Y. Watson, Feb. 2nd.

Sec. Lt. S. S. Church, Sec. Lt. T. H. May, Feb. 3rd; Sec. Lt. H. J. Collar, Lt.-Col. A. S. W. Dore, D.S.O., Lt. A. C. Hendry, M.C., Lt. F. R. Hatton, Lt. E. A. K. Hills, Sec. Lt. R. Jones, Sec. Lt. G. D. Knightley, Capt. M. A. Mackenzie, M.C. (R. Scot. Fus.), Lt. (actg. Capt.) D. V. D. Marshall, Sec. Lt. G. B. Mason, Lt. A. T. Miller, Sec. Lt. T. C. A. Meyer, Lt. (actg. Capt.) E. Swale, D.F.C., Feb. 4th; Sec. Lt. A. Lt. W. V. Adams, Lt. T. D. M. Blaset, Lt. H. C. Cassell, Lt. W. A. Campbell, Sec. Lt. W. T. Cairns, Lt. (actg. Capt.) G. Hasler, Sec. Lt. C. T. R. Miller, Sec. Stephenson, Lt. P. E. Tyson, Sec. Lt. H. O. Warren, Feb. 5th; Lt. A. W. Archer, Lt. W. R. C. Birney, Lt. R. E. Frampton, Lt. H. Garnett, Lt.-S. W. Graham, Lt. (actg. Capt.) H. G. Hegarty, M.C., Sec. Lt. A. J. Midgley, Sec. Lt. H. G. Mumford, Lt. H. Smith, Sec. Lt. R. Smith, Lt. H. Wardle, Lt. C. Watt, Feb. 6th; Sec. Lt. R. Wilson, Lt. H. Wright, Sec. Lt. G. D. Coates, Lt. T. Lt. T. C. Berry, Sec. Lt. F. Christelow, Sec. Lt. G. D. Stephenson, Feb. 7th; Marburg, Lt. W. G. D. H. Nicol, Sec. Lt. J. Stephenson, Feb. 7th; Sec. Capt. (actg. Maj.) H. H. Balfour, M.C., Lt. W. T. V. Harmer, Sec. Lt. W. F. Marr, Sec. Lt. A. R. Maggs, Sec. Lt. J. Mitchinson, Sec. Lt. J. Sellers, Feb 8th; Lt. A. Chadwen, Lt. J. Forbes, Sec. Lt. A. W. Johnstone, Sec. Lt. G. Marks, Lt. A. E. Smith, D.F.C., Feb. 9th; Sec. Lt. E. Anderson, Sec. Lt. E. C. Collymore, Sec. Lt. B. Hearne, Sec. Lt. S. W. Jackson, Sec. Lt. T. J. Warwick, Feb. 10th; Lt. C. W. Allan, Lt. G. F. C. Caswell, Sec. Lt. H. F. Carpenter, Lt. N. N. Cooper, Sec. Lt. T. Hargreaves, Lt. R. Hunter, Sec. Lt. G. H. Mackrow, Lt. (actg. Capt.) R. Montgomery, M.C., Lt. A. E. Turton, Sec. Lt. (Hon. Lt.) J. Wilson (Ayr. Yeo.), Feb. 11th; Sec. Lt. (Hon. Lt.) J. C. Alderton, Sec. Lt. C. M. Allan, Lt. J. C. Bell, Capt C. Courtneidge, Sec. Lt. W. Coomb, Sec. Lt. W. England, Sec. Lt. P. E. Foot, (Hon. Lt.) Sec. Lt. C. M. Knox, Lt. B. S. Lister, Lt. C. Martin, Sec. Lt. V. Ross (R. G. M. Engrs.), Lt. H. Walker, Sec. Lt. C. D. Thornton, Sec. Lt. E. N. Ward, Sec. Lt. W. L. Walker, Lt. S. Waltho, Feb. 12th; Lt. P. R. Cawdell (Capt., R.A.S.C., T.F.), Sec. Lt. H. Chester-Master, Sec. Lt. S. G. Jary, Lt. W. K. Macfarlane, Lt. N. J. Watson, Lt. A. F. Warren, Feb. 13th; Lt. C. G. Baker, Sec. Lt. L. W. Conway, Sec. Lt. A. Fletcher, Sec. Lt. P. G. Kew, Sec. Lt. W. R. Midgeley, Lt. R. D. Warren, Sec. Lt. J. A. Bird, Sec. Lt. L. Beavis, Capt. H. Barker, Capt. J. A. Barton, Lt. F. C. Coops, Sec. Lt. (Hon. Lt.) H. S. Collett, Sec. Lt. J. M. Dunlop, Lt. H. J. Goulding, Lt. I. Jeffreys, Sec. Lt. D. H. Keevil, Capt. A. Lindley, Sec. Lt. R. H. Milner, Feb. 15th; Sec. Lt. C. Band, Sec. Lt. W. O. Fenton, Sec. Lt. F. J. Fawcett, Lt. A. E. N. Jones, Capt. E. B. MacManus, Lt. J. A. Scrivener, Feb. 16th; Lt. B. T. Anderson, Sec. Lt. C. F. Ambler, D.F.C., Lt. O. H. Chilton, Sec. Lt. J. R. Colquhoun, Sec. Lt. (Hon. Lt.) R. H. Conran, Sec. Lt. E. I. Dallinger, Maj. R. W. Gow, D.S.O., Capt. W. D. Jackson, Sec. Lt. P. C. Lorea, Sec. Lt. H. C. Mann, Lt. P. R. Masson, Sec. Lt. J. M. Scott, Feb. 18th; Sec. Lt. R. H. Armstrong, Lt. B. D. Bate, M.C., Lt. F. G. Baker, Sec. Lt. S. A. Barnes, Sec. Lt. R. M. Campbell, Sec. Lt. W. F. Caldwell, Capt. W. H. E. Campbell, A.F.C., Sec. Lt. J. I. Elliott, Lt. J. J. Fenwick, Lt. R. S. Hitchcock, Lt. W. R. Heaton, Lt. (actg. Capt.) C. C. Hayward, Sec. Lt. J. H. Jameson, Lt. A. O. Lacy, Sec. Lt. H. S. Mantle, Lt. A. McL. Miller, Lt. H. P. Mallett, Sec. Lt. J. S. Stringer, Lt. W. B. Styles, Sec. Lt. E. Singleton, Sec. Lt. J. S. Ballance, Lt. J. L. Davies, Lt. A. P. Fitzgerald, Feb. 19th; Sec. Lt. G

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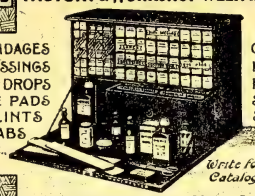
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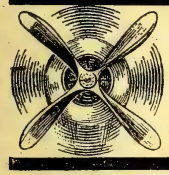


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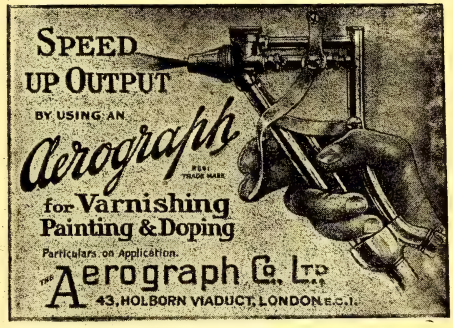
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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

Crawford, Sec. Lt. S. Harvey, Sec. Lt. J. W. Loudon, Sec. Lt. G. G. Marsland, Lt. W. H. Matthews, Feb. 21st; Capt. G. W. D. Allen, M.C., Lt. R. D. Coath, Sec. Lt. W. S. Chrystal, Lt. H. Harris, Lt. H. J. Jewell, Sec. Lt. J. T. McDougall, Sec. Lt. G. E. Mann, Lt. F. L. Roper, Lt. H. W. Russell, D.F.C., Sec. Lt. F. Smith, Feb. 22nd; Lt. W. J. Attwood, Lt. J. S. Andrews, Sec. Lt. A. J. Baxter, Lt. C. W. Beatty, Sec. Lt. H. P. Bennett, Lt. F. A. Coutts, Sec. Lt. E. R. Cornell, Sec. Lt. G. T. Campbell, Lt. P. T. Harris, Lt. W. P. Hawgood, Lt. D. Kennedy, Lt. H. B. Kerruish, Sec. Lt. F. L. Kay, Sec. Lt. N. M. McDougall, Sec. Lt. R. O. Reynolds, Lt. J. Ross, Sec. Lt. H. Rawsthorne, Lt. A. R. Talbot, Lt. H. L. Whiteside, Sec. Lt. G. Williams, Feb. 23rd.

Lt. A. L. Fleming, Maj. A. Gray, M.C. (M.G.C.), Lt. D. D. Jennery, Lt. P. O. Reiss, Feb. 24th; Sec. Lt. C. Alexander, Sec. Lt. L. S. Ford, Sec. Lt. E. P. Glanville, Lt. D. McC. Martin, Sec. Lt. (Hon. Lt.) A. J. Ross, Lt. R. D. Walker, Feb. 25th; Lt. F. J. Askham, Lt. J. Baird, Lt. A. H. Caley, Sec. Lt. A. W. Chamberlain, Lt. H. J. W. Collins, Sec. Lt. J. H. L. Cowin, Lt. (actg. Capt.) H. C. Haydock, Lt. M. N. Hancocks, Lt. A. Jackson, Sec. Lt. W. F. Jones, Sec. Lt. R. McKinnon, Lt. H. Mason, Lt. D. M. Rawcliffe, Sec. Lt. H. H. Rofe, Lt. G. G. Robertson, Feb. 26th; Lt. C. D. Bennett, Lt. R. G. Bennett, Lt. F. E. C. Benstead, Lt. R. Chalmers, Lt. W. Jaffray, Lt. C. F. Johnson, Sec. Lt. A. V. Redwood, Sec. Lt. H. H. Reeves, Lt. H. C. Rogers, Feb. 27th; Lt. G. R. Baynton, Lt. F. C. Harrison, Lt. (actg. Capt.) S. W. Highwood, Lt. A. G. Keorner, Sec. Lt. L. T. Rennie, Sec. Lt. H. E. Roenisch, Feb. 28th; Sec. Lt. J. A. Allen, Lt. G. W. P. Avery, Lt. F. Barrie, Lt. F. S. Coghill, Lt. G. H. Collis, Lt. O. Darlington, Sec. Lt. A. C. Faulkner, Lt. M. E. Gower, Lt. W. A. Hallgreen, Sec. Lt. H. H. Hanford, Lt. G. T. Harker, Capt. R. W. Jelliffe, Lt. J. G. Kerr, Capt. C. McNicoll, D.S.C., Lt. W. J. Pierce (Lpool R.), Lt. H. Pughe-Evans (Welsh R.), March 1st; Sec. Lt. L. F. Ashley, Lt. W. L. Andrew, Lt. W. Birch, Capt. F. C. B. Douglas, Sec. Lt. R. P. J. Doole, Lt. K. G. H. R. Gunn, Sec. Lt. J. W. Garratt, Capt. W. L. Hay, Lt. T. G. Jackson, Lt. C. W. Lane, March 2nd; Lt. R. B. Beevor, Sec. Lt. F. Dixon, Lt. (Hon. Capt.) R. E. B. Hunt, Lt. C. U. T. Jellings, March 3rd; Sec. Lt. E. O. W. Ayles, Lt. V. C. Blackmore, Sec. Lt. R. P. Chapman, Sec. Lt. M. R. De Miege, Lt. C. R. Dougall, Lt. W. Dobson, Sec. Lt. W. S. Emmott, Sec. Lt. C. M. Fraser, Capt. W. E. Foster, Sec. Lt. J. Franklin, Capt. R. Frame, Sec. Lt. A. Frome, Sec. Lt. M. Gardiner, Lt. A. S. Hanna, Lt. A. A. Hughes, Sec. Lt. A. W. Jackson, Sec. Lt. R. D. O'Neill, Sec. Lt. D. A. Watts, Lt. H. Wind, Lt. R. Watson, March 4th; Lt. B. S. Alexander, Sec. Lt. S. P. Blackwell, Lt. (actg. Capt.) A. Beck, Sec. Lt. J. A. Callaghan, Lt. V. C. Coombs, Sec. Lt. C. G. Haigh, D.F.C., Lt. C. W. Havne, Lt. T. Huins, Lt. H. M. Hames, Capt. W. Hall, M.C., Lt. H. Storey, Sec. Lt. G. Teather, March 5th; Lt. L. K. Baker, D.F.C., Lt. S. J. Chamberlain, D.F.C., Lt. J. G. Crang, Lt. S. J. Davies, Sec. Lt. P. W. Evans, Lt. H. F. Faulkner, Sec. Lt. B. H. Filkins, Lt. C. B. Fisher, Lt. F. R. Gollop (Manc. R., T.F.), Capt. P. H. Hepburn, Sec. Lt. R. G. Harris, Lt. J. E. Hearn, Sec. Lt. L. Jones, Lt. B. Jones, Lt. R. Jones, Sec. Lt. (Capt.) M. B. Knowles, Sec. Lt. E. R. Stockport, Lt. D. F. Taber, Sec. Lt. G. E. S. Thompson, March 6th; Lt. C. F. Ash, Lt. K. W. Bransby, Sec. Lt. W. Cameron, Sec. Lt. E. G. Corey, Lt. (actg. Capt.) F. A. V. Cook (Durh. L.I., T.F.), Sec. Lt. G. Davies, Maj. F. T. Digby, D.S.O., Sec. Lt. J. L. Davies, Lt. R. Findlay, Lt. C. Foster, Lt. H. G. George, Sec. Lt. W. Gracey, Maj. E. C. Horsfall, Lt. A. S. Hetts, Sec. Lt. C. E. Jones, Lt. E. C. H. Jones, Sec. Lt. F. V. Riley, March 7th; Sec. Lt. H. J. W. Alexander, Sec. Lt. D. J. Avery, Lt. E. D. Dalmaine, Sec. Lt. L. Duncombe, Lt. R. H. Dunlop, Lt. R. O. Ellis, Lt. L. R. Felton, Sec. Lt. E. W. Foster, Sec. Lt. E. Grimshaw, Sec. Lt. C. Hamilton, Lt. H. Hartley, Lt. J. W. Haynes, Lt. C. W. Harwood, Sec. Lt. J. R. Hill, Lt. T. R. V. Hill, Sec. Lt. F. H. Kay, Sec. Lt. W. W. Pritchard, Sec. Lt. J. O. Smith, Lt. E. G. Thomas, Lt. G. R. Warner, March 8th; Sec. Lt. B. W. H. Arnold, Lt. J. B. Bennett, Lt. H. P. Blakely, Sec. Lt. A. J. Broadberry, Sec. Lt. P. H. Dixon, Sec. Lt. D. P. Davies, Lt. W. O. Taylor-Hart, Capt. S. W. Thompson, Lt. J. Watt, B. Turner, Sec. Lt. F. H. Thirkell, Sec. Lt. W. H. Thornton, Lt. R. Walmsley, Lt. J. K. Watson, March 9th; Maj. F. W. K. Davies, Sec. Lt. J. R. Hill, Sec. Lt. H. C. Shearman, March 10th; Lt. (actg. Capt.) C. P. Allen, Sec. Lt. F. E. Birkett, Lt. H. Cartwright, Lt. F. H. Dormer, Lt. W. J. Downie, Sec. Lt. M. Dean, Lt. W. F. Doyle, Lt. J. S. Emery, Lt. A. A. Hughes, Sec. Lt. A. Harris, Lt. E. S. Hall, Sec. Lt. E. Heyes, Lt. F. T. Jackson, Sec. Lt. L. V. Russell, Sec. Lt. (Hon. Lt.) M. C. Tozer, Sec. Lt. C. J. M. Turner, Sec. Lt. E. T. Wales, Sec. Lt. J. S. Walthall, March 11th.

Sec. Lt. W. Anderson, Lt. G. D. Dodds (Durh. L.I.), Sec. Lt. C. M. Donald, Lt. F. W. Dolman, Sec. Lt. S. Dennis, Lt. R. T. Freeman, Sec. Lt. R. Field, Sec. Lt. W. J. Gracey, Lt. (actg. Capt.) H. Hamilton, Lt. (actg. Capt.) R. Manzer, D.F.C., March 12th; Lt. C. Bettinson, Sec. Lt. E. Cotton, Sec. Lt. F. E. J. Davis, Sec. Lt. J. W. Davies, Lt. R. G. Davis, Lt. H. Dean, Lt. T. C. Danby, Lt. F. J. Davey, Capt. G. Fox-Rule, Sec. Lt. G. E. McKenzie, Lt. E. Tasker, D.F.C., Lt. E. Walker, Sec. Lt. D. C. Watson, March 13th; Sec. Lt. J. Andrews, Lt. C. C. Allinson, Sec. Lt. C. K. David, Sec. Lt. G. Demorest, Sec. Lt. G. B. Friend, Sec. Lt. A. R. Green, Sec. Lt. J. Hinchey, Sec. Lt. D. F. Harrison, Sec. Lt. J. Hart, Sec. Lt. C. L. Lowe, Lt. C. L. Roberts, Sec. Lt. C. Stuart, Sec. Lt. (Hon. Lt.) R. Turner, Lt. A. J. Tyler, March 14th; Capt. J. W. Alcock, Sec. Lt. E. R. Airey, Lt. R. M. Darney, Sec. Lt. A. J. Evans, Sec. Lt. T. O. Pugh, Sec. Lt. L. C. Regester, Sec. Lt. H. H. Robbins, Lt. G. Rose, Lt. W. B. T. Ross, Lt. L. T. Smith, Lt. D. R. Snellgrove, Sec. Lt. (Hon. Lt.) F. S. Tooley, March 15th; Lt. (actg. Capt.) P. Ainsworth, Sec. Lt. G. J. Dickins, Sec. Lt. O. S. Parker, Lt. H. T. Roper, March 16th; Lt. H. G. S. Read, Sec. Lt. A. E. Hart, Sec. Lt. S. S. Rosenheim, Sec. Lt. H. G. Robinson, Sec. Lt. H. Townley, Sec. Lt. M. Thomrson, Sec. Lt. R. Watson, March 17th; Capt. O. M. Baldwin, D.F.C., Sec. Lt. E. W. C. Densham, Lt. R. C. Richards, Sec. Lt. C. Robson, Sec. Lt. L. J. Spence, Lt. G. L. Smart, March 18th; Sec. Lt. A. C. Davern, Lt. G. H. B. Richards (R. Highrs., T.F.), Lt. R. I. Poe, Capt. A. Sparrow, A.F.C., Capt. (Hon. Maj.) G. Stonehouse, Lt. G. E. Taylor, March 19th; Lt. H. Tatton, March 20th.

Capt. R. S. S. Brown, M.C., relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain his rank, March 29th.

Lt. M. Andrews relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, March 29th.

Sec. Lt. V. T. Lloyd-Davies relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, March 29th.

The notification in "Gazette," Nov. 1st, 1918, concerning Sec. Lt. J. M. Pacon is cancelled.

ADMINISTRATIVE BRANCH.—Capt. (Hon. Maj.) W. B. Crossley to be actg. Maj. whilst empld. as Maj., from (A.), Oct. 21st, 1918.

Lts. to be actg. Capts. whilst empld. as Capts.:—J. W. Langmuir, from (A.), July 1st, 1918; C. A. Howe, Nov. 4th, 1918; J. C. Cantrill, March 20th.

Sec. Lt. (actg. Lt.) A. H. Jones to be actg. Capt. whilst empld. as Capt., Nov. 1st, 1918.

Lts. (A.) to be Lts.:—O. Thamer, Jan. 23rd; E. N. MacDonald, Jan. 31st; (actg.-Capt.) R. T. Jones, D.F.C., Feb. 6th, and relinquishes the actg. rank of Capt.

Lts. to be Lts.:—C. Watson, from (O.), Nov. 1st, 1918; A. S. Mills, from (O.), Feb. 18th; W. K. Prendergast, from (A. and S.), Feb. 22nd; E. A. de Sain, from (S.O.), March 15th.

Sec. Lt. A. E. Marks to be Lt., Aug. 6th, 1918.

Sec. Lts. to be actg. Lts. whilst empld as Lts.:—R. P. Briscoe, June 26th, 1918; T. McGarr, Sept. 26th, 1918; F. W. Johnson, Nov. 1st, 1918, C. St. J. Vaughan, Dec. 13th, 1918.

Sec. Lts. to be Sec. Lts. from (A.):—(Hon. Lt.) A. W. Allan, June 4th, 1918, and to be Hon. Lt.; J. A. Shipton, Jan. 31st.

Sec. Lts. to be Sec. Lts., from (O.):—E. Singleton, Feb. 10th; S. F. Blackwell, Feb. 21st; A. B. Henderson, March 21st.

Sec. Lt. L. M. Britten to be Sec. Lt., from (T.), March 1st (substituted for notification in "Gazette," Feb 28th).

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. D. T. McGuire (Lt., Glouc. R.), Jan. 12th; Capt. A. H. Brucker (Capt., Oxf. and Bucks L.I., T.F.), Jan. 18th.

The following are transferred to unempld list:—Lt. (Hon. Capt.) J. H. Menzies, Jan. 5th; Sec. Lt. W. J. Gallard, Jan. 17th; Lt. (actg. Capt.) N. B. Morphy, Jan. 20th; Sec. Lt. W. A. Malcolm, Lt. P. H. G. Southwell, Jan. 22nd; Sec. Lt. F. W. Carr, Lt. C. F. Cowper, Jan. 23rd; Lt. (actg. Capt.) H. Goulton, Sec. Lt. H. G. Cartman, Captain E. Edwards, Lt. J. W. Jackson, Jan. 28th; Sec. Lt. C. C. L. Marcionni, Jan. 29th; Sec. Lt. J. J. Evans, Jan. 31st; Capt. G. H. Watts, Feb. 1st; Lt. G. J. Frost, Feb. 2nd; Lt. E. A. Bastow, Lt. G. Feeny, Feb. 3rd; Sec. Lt. J. W. Hill, Sec. Lt. P. M. McNair, Feb. 4th; Sec. Lt. W. Gordon, Sec. Lt. R. C. Smith, Lt. (actg. Capt.) W. Topham, Feb. 5th; Lt. (actg. Capt.) W. D. Kennard, Feb. 7th; Lt. W. Hurst-Barnes, Sec. Lt. C. Moss, Sec. Lt. H. Rodgers, Feb. 8th; Capt. J. L. Lewis, Feb. 9th, Lt. C. W. B. Colling, Lt.-Col. (actg. Col.) V. Henry, Lt. F. G. Matthews, Feb. 12th; Lt. W. L. Coleridge, Lt. H. C. G. Watney, Feb. 13th; Lt. A. Miller, Feb. 14th; Lt. A. H. K. Jones, Sec. Lt. (Hon. Lt.) (actg. Lt.) R. F. Messervy, Feb. 15th; Sec. Lt. C. H. Kendall, Feb. 16th; Sec. Lt. A. P. Mannars, Feb. 18th; Lt. S. Canning, Sec. Lt. S. R. Dickson, Feb. 19th; Lt. W. W. Legg (R.F.A., Spec. Res.), Feb. 20th; Sec. Lt. E. Deekes, Sec. Lt. G. M. Gray, Feb. 21st; Sec. Lt. E. B. Appleby, Lt. V. W. Hatton, Sec. Lt. W. S. Lucas, Lt. H. H. Neal, Feb. 22nd; Sec. Lt. A. Abbott, Sec. Lt. C. N. S. Burns, Lt. G. Johnstone, Feb. 26th; Lt. L. W. Elledge, Lt. (actg. Capt.) A. McIntosh (Lt., K.O.S.B.), Sec. Lt. B. Rose, Sec. Lt. V. H. Richardson, Sec. Lt. J. A. B. Young, Feb. 27th; Sec. Lt. J. A. Black, Lt. G. P. Colin, Lt.-Col. J. Harvey, Sec. Lt. T. J. Jones, Lt. G. Mayhew, Feb. 28th; Sec. Lt. (Hon. Lt.) J. C. Bain, Lt. P. W. Dyke, Lt. J. V. L. Hall, March 1st; Sec. Lt. A. G. Coxhead, Sec. Lt. K. C. Dickinson, Sec. Lt. A. F. Tawry, Sec. Lt. W. G. Stephens, March 4th; Sec. Lt. C. Campbell, March 5th; Sec. Lt. F. G. Brown, Sec. Lt. A. Farrar, March 6th; Capt. H. Duveen, Lt. F. A. George, Sec. Lt. E. J. Harris, Sec. Lt. H. Horden, Lt. H. O. Samson, March 7th; Sec. Lt. W. Simpson, March 8th; Sec. Lt. T. Sunliffe, Lt. G. H. Davis, Sec. Lt. S. Franks, Capt. Sir A. G. Hazlerigg, Sec. Lt. C. W. Johnson, Sec. Lt. J. B. Kettle, Maj. L. Legge, March 11th; Sec. Lt. A. T. Dickinson, Capt. T. M. Gerrard, March 13th; Sec. Lt. G. V. Jennings, Lt. T. A. Loveridge, Capt. A. B. Walters, March 14th; Lt.-Col. W. M. Hall (actg. Capt.) W. Romney, March 15th; Sec. Lt. W. S. Scott, March 17th; Sec. Lt. R. A. Stuart, Sec. Lt. A. A. Tabor, March 18th; Sec. Lt. W. Tunnicliffe, Sec. Lt. P. P. Thornton, March 19th; Lt. (actg. Capt.) J. A. Stevenson, M.C., March 20th; Sec. Lt. H. Randall, March 28th.

Lt. (actg. Capt.) W. H. T. Collings relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain the rank of Capt., Nov. 27th, 1918 (substituted for notification in "Gazette," Nov. 26th, 1918).

Capt. L. E. Eeman relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, Feb. 11th).

Lt. G. Davidson relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, March 29th.

The surname of Sec. Lt. D. A. Boulton is as now described, and not as stated in "Gazette," Oct. 29th, 1918.

The surname of Sec. Lt. R. H. Mullens is as now described, and not as stated in "Gazette," Feb. 7th.

TECHNICAL BRANCH.—Capt. J. S. Wheelwright, D.S.C., to be actg. Maj. while empld. as Maj. (Grade A), from (A. and S.), July 18th.

G. S. M. Taylor (Capt., R.E.) is granted a temp. commn. as Capt. (Grade A), April 1st, 1918.

Capt. G. L. Watson to be Capt. (Grade B), from (Ad.), Aug. 15th, 1918.

Lt. (Hon. Capt.) S. Smith to be actg. Capt. while empld. as Capt. (Grade A), Dec. 1st, 1918.

Sec. Lt. (actg. Capt.) A. J. Bright retains the actg. rank of Capt. while empld. as Capt. (Grade B), from (Ad.), Oct. 1st, 1918.

Sec. Lt. (actg. Lt.) G. J. Stroud, M.B.E., to be actg. Capt. while empld. as Capt. (Grade A), Oct. 21st, 1918.

Lt. H. Stansfield to be actg. Capt. while empld. as Capt. (Grade B), from (O.), Nov. 2nd, 1918.

Sec. Lt. (actg. Capt.) J. I. Thompson to be Lt., Aug. 9th, 1918, and to retain the actg. rank of Capt.

Lt. (actg. Capt.) J. Jefferson to be Capt. (Grade B), from (Ad.), Nov. 11th, 1918 (substituted for notification in "Gazette," Dec. 13th, 1918); J. T. Titmas, March 20th.

Sec. Lts. to be actg. Lts. while empld. as Lts. (Grade A):—G. J. Stroud, M.B.E., April 1st, 1918; C. W. Whitworth, from (Ad.), Sept. 1st, 1918.

Sec. Lts. (Hon. Lts.) to be actg. Lts. whilst empld. as Lts. (Grade B):—E. A. Bradshaw, J. C. Snelgrove, April 1st, 1918; P. Rourke, July 1st, 1918; F. J. Magee, Nov. 1st, 1918.

Sec. Lts. to be Sec. Lts. (Grade B), from (Ad.) (substituted for notification in the "Gazette," March 18th):—C. H. Bunn, Dec. 1st, 1918; J. L. Bingham, H. A. Swoffer, J. Tunbridge, Jan. 4th; C. E. Easton, Jan. 14th; L. J. Slack, Jan. 18th; C. M. Byham, Jan. 25th; G. H. Stanley, Feb. 25th; H. S. Smith, March 4th.

Sec. Lt. (Hon. Lt.) A. W. Allan to be Sec. Lt., from (Ad.), and to be Hon. Lt., Aug. 11th, 1918.

Sec. Lt. J. T. Brown to be Sec. Lt. (Grade A), from (Ad.), Feb. 1st.

Sec. Lt. J. W. Thompson (late Gen. List, R.F.C., 191 prob.) is confirmed in his rank as Sec. Lt. (Grade A), Oct. 25th, 1918.

Sec. Lt. F. Hogg to be Sec. Lt. (Grade B), from (Ad.), Jan. 31st.

J. Johnstone (Lt., Som. L.I.) is granted a temp. commn. as Sec. Lt. (Grade B), Nov. 1st, 1918, seny. April 1st, 1918, and to be Hon. Lt. (substituted for notification in "Gazette," Feb. 19th).

Capt. C. Horsfield relinquishes his commn. on ceasing to be empld., March 1st.

The following are transferred to unempld. list:—Sec. Lt. P. S. Beaufort, Jan. 16th; Lt. (actg. Capt.) R. W. Mitchell, Jan. 12th; Sec.

Lt. H. R. Moffatt, Jan. 14th; Sec. Lt. (Hon. Lt.) N. W. Watson, Jan. 19th; Lt. Hon. H. G. H. Mulholland, Lt. D. Warneford-Davies, Jan. 25th; Lt. J. H. Dickson, Jan. 26th; Sec. Lt. F. H. Jones, Jan. 28th; Sec. Lt. C. G. Ellis, Maj. T. L. Oliver, Lt. M. Proctor Gregg (N. Lanc. R.), Jan. 29th; Maj. H. Dobell, Capt. B. G. Ludlow, Jan. 30th; Sec. Lt. A. Campbell, Lt. V. L. Pielder, Lt. M. A. Millar, Sec. Lt. (Hon. Lt.) J. Murch, Jan. 31st; Sec. Lt. (actg. Lt.) R. Hall, Lt. L. G. Kemp, Feb. 1st; Sec. Lt. T. Coulan, Feb. 4th; Sec. Lt. H. A. Chapman, Sec. Lt. P. Coombs, M.B.E., Feb. 6th; Capt. A. H. Davies, Sec. Lt. H. G. Wallis, Feb. 7th; Capt. M. F. W. Sampson, Lt. W. J. Walford, Feb. 8th; Lt. H. S. G. Jamiteson (R. Surr. R.), Lt. J. M. Scott, Feb. 9th, Lt. T. Cooper, Feb. 10th; Sec. Lt. (Hon. Lt.) G. McDonald, Sec. Lt. S. Warburton, Lt. R. Warner, Feb. 11th; Lt. P. Avery, Sec. Lt. (Hon. Lt.) F. Allden, Lt. C. L. Lambert (Lond. R., T.F.), Lt. F. Waller, Feb. 13th; Lt. J. W. Atkinson, Sec. Lt. J. T. Baugh, Feb. 14th; Lt. (Hon. Capt.) K. G. de Jongh (Hamp. R.), Capt. N. Martin, Capt. E. W. Walford, Feb. 15th; Lt. L. W. Wethered, Feb. 17th; Lt. F. R. Atkinson, Sec. Lt. (Hon. Lt.) A. J. D. Henry (R.F.A.), Sec. Lt. S. Kendall, Capt. C. G. McCann, Feb. 18th; Capt. S. C. H. Davis, Sec. Lt. (Hon. Lt.) C. Keith, Feb. 19th; Sec. Lt. J. H. Jones, Lt. (actg. Capt.) F. H. M. Macintyre, Sec. Lt. A. Matthews, Feb. 20th; Capt. W. G. Aston, Lt. J. P. Bishop, Sec. Lt. (actg. Capt.) W. H. D. Chamberlain, Sec. Lt. B. E. Harris, Lt. B. S. Higgs, Capt. (actg. Maj.) H. W. Mills, Sec. Lt. J. Marra, Feb. 22nd; Lt. S. F. Barton, Sec. Lt. (Hon. Lt.) H. G. Hall, Lt. W. H. Jones, Lt. R. N. Rowell, Feb. 23rd; Sec. Lt. A. J. Barnes, Feb. 24th; Maj. F. R. E. Davis, Sec. Lt. R. F. H. Heenan, Lt. (actg. Capt.) W. L. Hill, Capt. J. Richmond, Lt. J. Watson, Feb. 25th; Sec. Lt. W. Foster, Leigh, Feb. 26th; Capt. H. M. Edwards, Capt. B. Elliott, Lt. B. V. N. Rowcroft, Feb. 27th; Lt. J. E. Jones, Sec. Lt. T. M. F. Tamblyn-Watts, March 1st; Lt. B. E. C. Davis, Sec. Lt. E. Haffemore, Sec. Lt. B. F. Warburton, March 2nd; Lt. (actg. Capt.) R. M. Arunfield, Sec. Lt. (actg. Lt.) E. S. H. Corbett, Lt. V. B. Learoyd, March 4th; Sec. Lt. F. Cady, Sec. Lt. F. Downs, Lt. D. W. Dron, Capt. R. Donald, Sec. Lt. A. E. Firth, Capt. J. W. Griffith, Sec. Lt. H. T. Savage, March 5th; Sec. Lt. D. O. Cochrane, Capt. J. B. Crabbs, Sec. Lt. H. J. Doherty, Sec. Lt. G. R. Hanson, March 6th; Lt. D. Dougall, Capt. W. J. F. Dutson, Capt. A. B. Hatton, Sec. Lt. S. E. Knight, Lt. W. J. Watts, March 7th; Sec. Lt. H. A. Atkinson, Lt. R. W. Anderson, Lt. B. V. Brown, Sec. Lt. C. G. Foster, Sec. Lt. (Hon. Lt.) G. W. Robinson, Lt. E. H. Watson, Sec. Lt. C. W. Waitt, March 8th; Sec. Lt. F. Dugdale, Lt. J. P. White, March 9th; Maj. R. Waddell, March 10th; Lt. H. L. Billington, Lt. Hon. F. S. G. Calthorpe, Capt. P. J. Jones, Sec. Lt. J. Keyte, Lt. R. Knott, March 11th; Lt. Capt. M. A. Chappell, Sec. Lt. (Hon. Lt.) (actg. Capt.) A. L. Cockburn, Sec. Lt. A. T. Griffith, Sec. Lt. A. Randle, March 12th; Sec. Lt. F. S. Armbister, Capt. A. C. Baker, Lt. F. A. Thomas, March 14th; Sec. Lt. H. C. Bell, Lt. W. E. Bousfield, Capt. G. E. Johnson, Sec. Lt. H. A. Kelly, Sec. Lt. P. E. Towler, Sec. Lt. E. F. Warner, Lt. E. Ward, March 15th; Sec. Lt. (Hon. Lt.) H. J. B. Peth, March 15th; Lt. A. C. B. Hanbury, Sec. Lt. P. C. Martin, March 16th; Sec. Lt. G. S. Adams, Lt. B. Humphrey, Capt. M. F. L. Selby, March 18th; Maj. G. H. Abell, March 19th; Maj. (actg. Lt.-Col.) B. W. Stedman, March 21st.

Capt. S. N. Cooke relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, March 26th.

The notification in "Gazette," Dec. 17th, 1918, concerning Lt. (actg. Maj.) H. Stansfield is cancelled.

The notification in "Gazette," Jan. 31st, concerning Lt. J. W. Thomson is cancelled.

Medical Branch.—The following are transferred to unemplд. list:—Lt. W. A. Cooper, Jan. 24th; Capt. W. A. Simpson, Feb. 4th; Capt. B. P. Carmody, Feb. 11th; Lt. H. McP. Cargin, Feb. 12th; Capt. H. R. Carter, Capt. (actg. Maj.) L. Hoover, Feb. 22nd; Capt. H. T. Harty, Capt. J. F. Walker, M.B.E., March 1st; Lt. R. Malcolm, March 4th; Capt. B. E. Annoot, March 13th.

The date of relinquishment of his commn. of Capt. H. Greenwood is Jan. 19th, and not as stated in "Gazette," Jan 21st.

Dental Branch.—Capt. T. F. Healey is transferred to unemplд. list, Feb. 27th.

Physical Training Branch.—Capt. (actg. Maj.) B. T. Metcalfe is transferred to unemplд. list, Feb. 16th.

Chaplains Branch.—The following temp. appts. are made:—Principal Chaps. for Presbyterians.—Rev. W. Moffat (A.C.D.) is granted a temp. commn. as Chap. with the relative rank of Capt., and is granted the relative rank of Col. whilst emplд. as Principal Chap., Jan. 1st (subst.-tuted for notification in the "Gazette," Feb 4th).

Asst. Principal Chap. for United Board.—Rev. J. Firth, M.C. (Chaplain, 4th Cl., A.C.D.), is granted a temp. commn. as Chap. with the relative rank of Capt., and is granted the relative rank of Maj. whilst emplд. as Asst. Principal Chap., Feb. 28th.

Capt. W. G. Carpenter is transferred to unemplд. list, March 7th.

Memoranda.—Capt. F. J. Hooper is confirmed in the rank of Capt.

Sec. Lt. (actg. Lt.) J. W. Huthwaite to be Lt., March 16th.

The following are transferred to unemplд. list, from (S.O.):—Capt. T. L. Tillie (Sco. Rif., T.F.), Jan. 19th; Capt. A. W. Dodds, Feb. 11th; Maj. (actg. Lt.-Col.) Visct. G. M. G. F. H. Maidstone, D.S.O., Feb. 16th; Capt. (actg. Lt.-Col.) B. J. Wolfe-Barry, Feb. 28th; Capt. (actg. Lt.-Col.) J. F. Hawkins, O.B.E., March 1st; Sec. Lt. (actg. Capt.) R. Hely, March 5th; Maj. K. T. Dowding, Capt. P. M. Davson, Lt. (actg. Capt.) H. Fletcher, March 11th; Sec. Lt. (actg. Lt.) (Hon. Capt.) A. H. Fynn, March 17th; Maj. M. H. P. Allen, March 18th, Capt. A. E. Hartley, March 24th.

War Office, March 31st.

Regular Forces—Establishments.—Royal Regiment of Artillery, R.H., and R.F.A.—Maj. (temp. Lt.-Col.) J. C. G. A. Hankey, M.V.O., O.B.E., Res. of Off., reverts to unemployment, April 1st, and retains rank of Lt.-Col.

War Office, March 31st.

The services for which the Victoria Cross was awarded by His Majesty to the undermentioned officers were performed at the places and on the dates mentioned:—

Lt. (T./Capt.) A. Ball, D.S.O., M.C., late 7th Bn. Notts and Derby R., and R.F.C. France, distinguished flying servs.). ("Gazette," 8/6/17.)

Capt. W. A. Bishop, D.S.O., M.C., Can. Cav. and R.F.C. Nr. Cambrai, France (distinguished flying servs.). ("Gazette," 11/8/17.)

2nd Lt. (T./Capt.) J. B. McCudden, D.S.O., M.C., M.M., Gen. List, and No. 56th Sqdn., R.F.C. Distinguished Flying Services, France, 23/12/17, 30/1/18. ("Gazette," 2/4/18.)

1396 Serjt. T. Mottershead, late 20th Sqdn, R.F.C. Nr. Ploegsteert Wood France, 7/1/17. ("Gazette," 11/2/17.)

Capt. (T./Maj.) L. W. B. Rees, R.A. and R.F.C. Double Crassieurs, France, 1/7/16. ("Gazette," 5/8/16.)

Lt. W. L. Robinson, Worc. R. and R.F.C. Cuffley, Hertfordshire, England, 2-3/9/16. ("Gazette," 5/9/16.)

FROM THE COURT CIRCULAR.

Buckingham Palace, March 27th.

The following were severally introduced into the presence of the King, when His Majesty invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:—

The Distinguished Service Order and the Military Cross and Bar.—Capt. Peter Carpenter, R.A.F.

The Most Excellent Order of the British Empire.—Members—Military Division.—Capt. Alexander Smith, 12th Lancers, attd. R.A.F.

The King then conferred decorations as follows:—

The Military Cross.—Capt. Horace Haycock, R.A.F.; Capt. Ernest Peacock, R.A.F.; Lt. Haddon Adams, R.A.F.; Lt. Frank Dear, R.A.F.; Lt. Harry Wisnekowitz, R.A.F.

The Prince of Wales, accompanied by the Prince Albert, and attended by Captain the Hon. Piers Legh and Major Louis Greig, visited the Handley Page Works at Cricklewood this morning.

In the afternoon the Prince of Wales, accompanied by the Prince Albert, and attended by Major-General Sir Charles Harington, Captain the Hon. Piers Legh, and Major Louis Greig, were present at the Army Command Cross-Country Championships at Kenley Aerodrome.

Buckingham Palace, March 29th.

The following officers were severally introduced into the presence of the King, when His Majesty invested them with the Insignia of the respective divisions of the Order into which they had been admitted.

The Most Honourable Order of the Bath (Military Division)—Companion.—Brig.-Gen. Oliver Swan, R.A.F.

The Most Distinguished Order of St Michael and St. George—Companions.—Brig.-Gen Hugh Dowding, R.A.F., and Col. Reginald Armes, R.A.F.

The Distinguished Service Order.—Col. Wilfred Freeman, R.A.F., and Major Charles Darwin, R.A.F.

The Most Excellent Order of the British Empire—Officer.—Major Francis Davis, R.A.F.

The King then conferred decorations as follows:—

Bar to the Military Cross.—Capt. William Fielding-Johnson, R.A.F.

The Military Cross.—Capt. Frederick Mathias, R.A.F.; Capt. Frank Taylor (Cent. Ontario Regt., attd. R.A.F.); Capt. Hugh Walmsley, R.A.F.; Capt. Frederick Williams, R.A.F.; Lt. Henry Maingot (British West Indies Regt., attd. R.A.F.).

St. James's Palace, April 1st.

The King has been graciously pleased to give orders for the following promotions in and appointments to the Most Excellent Order of the British Empire in recognition of valuable services rendered in connection with the War:—

To be an Officer of the Military Division of the said Most Excellent Order.

Lieut.-Commdr. Henry Douglas Capper, R.N. For valuable services in connection with the R.N. Anti-Aircraft Corps at Dover.

THE CASUALTY LIST.

MILITARY.

Reported, March 31st.

Released Prisoners of War from Germany arrived in England:—Joubert de la Ferté, Sec. Lt. J. C., R.F.C.; Meakin, Sec. Lt. G. E. R., R.F.C.; Prichard, Capt. F. H., R.F.C.; Trulock, Sec. Lt. J. C., R.F.A., attd. R.F.C.

Australian Imperial Force.—*Previously Reported Missing, now Reported Killed*:—Jack, Capt. T., M.C., A.F.C.

Jeffers, Lt. J. P., A.F.C.

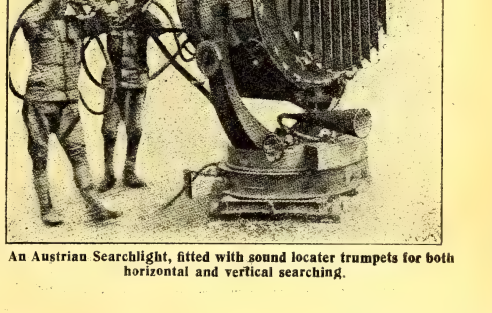
Peel, Sec. Lt. J. C., A.F.C.

PERSONAL NOTICES.

NAVAL.

Marriage.

RATHBORNE—RAINES.—On March 29th, at St. Paul's, Hammersmith, Lieut.-Col. C. E. H. Rathborne, D.S.O., R.A.F.,



An Austrian Searchlight, fitted with sound locater trumpets for both horizontal and vertical searching.

late R.N.A.S., son of the late H. H. Rathborne, Esq., and Mrs. Rathborne, of Cheltenham, was married to Olive Alice, elder daughter of the late H. H. Raines, Esq., of The Moorings, Woking, and Mrs. Raines, 5, Digby Mansions, W.6, by the Rev. Kennedy Cobb.

BIRTH.

EDMONDS.—On March 28th, 1919, at 1, Drayton Terrace, S.W., the wife of Lieut.-Col. C. H. K. Edmonds, D.S.O., O.B.E., late R.A.F., of a son (stillborn).

MILITARY.

ENGAGEMENT.

WILSON—COOK.—The engagement is announced between Capt. W. H. Sugden Wilson, West Somerset Yeo., attd. R.A.F., second son of Mr. W. H. Wilson and the late Mrs. Wilson, of Hexgreave Park, Southwell, and Lena, widow of Mr. L. A. N. Slocock, 10th King's Liverpool (Scottish) Regt., and third daughter of Mr. and Mrs. Arthur Cook, of Oaken Grove, Marlow, and of Liverpool.

MARRIAGE.

JAMES—GUTHRIE.—At St. Margaret's, Westminster, on March 27th, the marriage took place of Lieut.-Col. A. James, M.C., Hussars and R.A.F., and Bridget, elder daughter of the late Mr. Murray Guthrie, M.P., and Mrs. Guthrie, Stirling. The Archbishop of Armagh and the Sub-Dean of the Chapels Royal, Canon Edgar Sheppard, officiated.

BIRTHS.

BARBER.—On March 20th, at 12, Keats Grove, N.W., the wife of Horatio Barber, late R.F.C., of a son.

EVANS.—On March 24th, at 1, Rockville, Tenby, the wife of Capt. W. Sandford Evans, the Welch Regt. (attd. R.A.F.)—a son.

* * *

Information is wanted as to the fate of Lieut. R. E. Bion, 20th Hussars, attd. R.A.F., No. 40 Squadron, who took part in an attack on April 18th, 1918, near Lacon, and who fell and was presumably taken prisoner, but from the moment of the attack all trace of him has been entirely lost. His relatives, who are in India, are anxious to hear of his fate, and hope that this will catch the eye of some of his fellow officers. Communications will be gratefully received, addressed to "Secretary to Headmaster, Clayesmore School, Winchester."

AIR FORCE.

DEATHS.

MARCHANT.—Lieut. Clarence Henry Marchant, Croix de Guerre et Palme, R.A.F., who was accidentally killed whilst instructing in aerial fighting in Egypt, was the second son of the late W. W. and Mrs. Marchant, of "Tickners," Hantshurst, Kent. He was 25 years of age.

RAW.—Lieut. Wilfrid Addison Raw, R.A.F., who died on March 16th after an accident while flying at Hornchurch, was the eldest son of Robert Raw, of Pretoria, S. Africa. He was 19 years of age.

ENGAGEMENT

WETHERBY-WILLIAMS—STOMPH.—A marriage has been arranged, and will shortly take place, between Mr. Arthur Wetherby-Williams (late R.A.F.), only son of Thomas Wetherby-Williams and Mrs. Wetherby-Williams, of Mount Pleasant, Ilfracombe, and Helene Sonia Raymonde de Stomph, only child of His late Excellency General Baron Antoine de Stomph and of Baronne Sophie de Stomph, née Comtesse Zyndram Kovstialkovsky.

MARRIAGES.

HEWITT—WOODHOUSE.—On March 25th, at St. Mark's, Farnboro, Lieut. Edward Norman, R.A.F., son of Mr. and Mrs. Edward Hewitt, Swinton Park, Manchester, was married to Cecilia Ruth, daughter of Major-General Sir T. P. Woodhouse, K.C.M.G., C.B., and Lady Woodhouse, Fairfax House, Farnboro, Hants, by the Rev. Basil Phillips.

TIDEY—GOODALL.—On March 25th, at Holy Trinity Church, Bembridge, Isle of Wight, Capt. A. Mansfield Tidey, R.A.F., was married to Luisita Mary Goodall, by the Vicar, the Revd. E. C. Usherwood.

BIRTHS.

BALLARD.—On Jan. 20th, at Cottenham Park, S.W., to Betty, wife of Capt. Maurice Ballard, R.A.F., a daughter (Valerie Louise).

GRENFELL.—On March 28th, at a nursing home in London, the wife of Colonel G. P. Grenfell, D.S.O., R.A.F., of a daughter.

NEWSOME.—On March 23rd, at The Glen, Jeppa, Edinburgh, the wife of Lieut. Tom Newsome, jun., R.A.F., of a son.

* * *

Capt. and Flight Commander Sydney Philip Smith, R.A.F., of the 46th Squadron, France. Last seen April 6th, 1918, over Lamotte, on "Camel" Plane D.6491. Will repatriated officers and men (and those flying with him at the time) who can give information write Mr. Arthur H. Smith, Morningside, Aldershot?

The Atlantic Fleet.

It is announced that the following vessels are included in the provisional composition of the Atlantic Fleet:—

Seaplane Carriers: "Furious," "Vindictive," "Argus," "Pegasus" and "Nirvana."

Demobilised Airmen.

The Air Ministry states that in future a demobilised airman may retain his greatcoat and forfeit £1 of his war gratuity. In such a case shoulder-straps, service buttons, and badges of rank must be removed. The greatcoats may be dyed.

Owing to temporary dearth of materials, it will not be possible to forward within 28 days a civilian suit to every airman who has elected to take plain clothes in lieu of £2 12s. 6d. In cases of delay the airman will be given the option of waiting or of receiving £2 12s. 6d.

Complaints regarding non-receipt or misfit should be addressed to the Officer in Charge, Discharged Soldiers' Clothing Section, Battersea Park, S.W.11.

No man is permitted to wear uniform on expiration of his 28 days' furlough, but khaki clothes may be worn, provided shoulder straps, service buttons, and badges have been removed. In this case the field service cap will not be worn.

Athletics in the R.A.F.

At the meeting of the Royal Air Force Recreational Council, which was held at the Air Ministry, it was announced that the King would present a challenge cup to the Royal Air Force. The cup will be competed for at the annual athletic meeting to be organised by the Royal Air Force Athletic Association.

Despite very wet and windy weather the members of the R.A.F. at Elsham Aerodrome held a successful gymkana on Wednesday, March 19th. There were numerous competitors for the many events. The subsequent concert and dances were greatly appreciated.

On Wednesday, March 26th, the R.A.F. Association Football Team played the Cambridge University eleven at Stamford Bridge. A fairly evenly-matched game was witnessed, which finished with the R.A.F. the losers by 3 goals to 2.

On the same day the R.A.F. (Roehampton) Team met the Grenadier Guards eleven for the second time in the semi-final round of the Bulldog Cup competition. The game ended in a draw, both sides having scored one goal each.

The Royal Air Force Rugby Football Team beat the Australian fifteen at Gloucester on Saturday, March 29th. This was another one of the matches arranged for the Inter-Service Rugby Tournament, and the first the R.A.F. have won.

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THE AEROPLANE

Edited by C. C. Carey

WEDNESDAY, APRIL 9, 1919.

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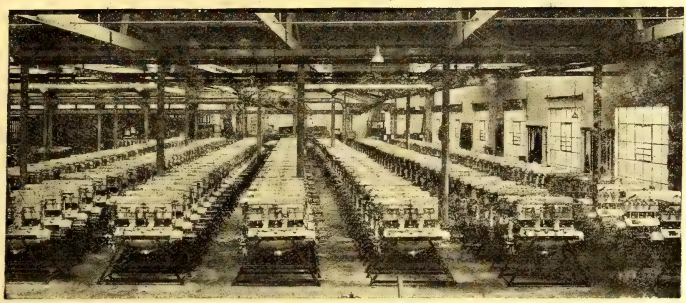
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ON "WHAT SHALL WE DO WITH OUR BOYS?'

Years ago, when most of our beribboned heroes of to-day were little boys in short frocks, there arose in the daily news-sheets, during the contemporary sea-serpent and giant gooseberry season, a violent controversy which raged for weeks under the standing heading, "What Shall We Do With Our Boys?" This question as to the future destinies of the youth of Great Britain—excluding the Irish Republic, which can look after itself—seems more urgent to-day than ever it was, for some hundreds of thousands of our boys are in a very peculiar position.

For the past four and a half years every lad on attaining the age of eighteen has been drafted into the Army unless he has elected to go into the Navy—excepting those who for a year past have entered the Air Force, and those who have been sufficiently skilful (as wanglers, if not as tradesmen) to get themselves retained as munition-makers, members of the Amalgamated Society of Engineers, and so forth. The result is that, despite the casualties of war and the successes of the influenza microbe, we have in the British Isles an enormous population of able-bodied young men who went straight from school into the King's Services, and who are now about to be turned adrift on an unsympathetic world without any knowledge of how to make a living.

They vary greatly in age, for at one extreme we have the University man of twenty or so, who joined the Army in 1914, and is now twenty-five or twenty-six years of age. We have the lad who joined at the minimum age of seventeen-and-a-half just before the Armistice, and is now barely eighteen. Also we have the enthusiast who joined in 1914 or early 1915 at the age of seventeen or even less, patriotically lying that he was nineteen, and who is now somewhere between twenty-one and twenty-two, a battle-scarred veteran (please avoid a misprint here, friend Printer), possibly with rank as captain or even major, with an excellent education in war, and no other knowledge which will help him to earn a living—except, perhaps, an intimate acquaintance with the arts of wangling and scrounging.

So far as those who are still under nineteen, or even twenty, are concerned, there is little need for anxiety. The officers can go back to the University, or the medical school, or the engineering college, or the theology factory, or the suburban polytechnic, or whencever they came, and continue their studies, or begin to study at such institutions. Thousands have been already demobilised as "students." The N.C.Os. and men can become, or go back to their work as, apprentices in the great industries.

The Middle-Aged Boy.

Those who are a little older, say between twenty-one and twenty-two, and have three or four years' service behind them, are much more difficult to fit into any working scheme of things, for they are rather old to start a schoolboy's work over again, and, though they may be very amenable to discipline under a man whom they respect, they are hardly likely, after years of experience of the realities of life and death, to be easy material for worn-out theories on education as held by the common or classroom pedagogue. There is here, however, the saving clause that many teachers from universities, public schools, and the lesser educational establishments have themselves served the King and have become men instead of merely sententious schoolmasters.

Still one can scarcely expect, say, an officer of the Flying Services who has slain his dozen Huns or so with his own little gun, besides acquiring a nice taste in midday cock-tails and post-prandial port, to become a Sandford or a Merton.—For the benefit of those who are young enough to have been spared the affliction of reading about Sandford and Merton one had better interpolate the information that they were two model students, worse even than Eric or Julian Home, and would have regarded Stalky and Co. as brands prepared for the burning.

One knows cases in which these middle-aged boys, as one may call them, have been demobilised as students, and after a hectic period of attempting to study—or "having a look to see what studenting was like"—as one of them put it—have rushed back to their old C.Os. or to their depots and have clamoured to go "back to the Army again," or to the R.A.F., as the case might be. Some have been successful, but some have not. Those who have drawn their gratuities, have spent the money on having a post-bellum burst, and have been allowed to rejoin are the lucky ones.

The Will and the Way.

Those who have kept their gratuities as a nest-egg and have set out to seek for work are perhaps less lucky. One has heard of a case, for example, of one earnest lad whose tastes run to science, and whose chief desire is a B.Sc. degree. He applied to the Appointments Department of the Ministry of Labour—an excellent institution worthy of all support from employers who want men of the right stamp—but, having had no specialised education, could find no job which would provide him with a living and allow him time for study.

The only marketable knowledge which he had acquired in the R.A.F. concerned the running of internal-combustion engines, and the only job which the Appointments Department had available at that moment wherein such knowledge could be used was that of chauffeur to a wealthy man who offered a decent wage. Being an eminently sensible lad, the young officer took the job, arguing that while he would be sitting around waiting for his employer he would have plenty of time for reading.

The idea has much to commend it. One can imagine many worse studies than the interior of a lordly limousine.

Appointments for All.

Therefore, one would like to draw attention to the fact that officers and men of the R.A.F. who are looking for jobs ought to use the machinery set up by the Government to help them in their quest, in the hopes of finding appointments for all. The mere name "Ministry of Labour" is admittedly enough to put one off any desire to use that machinery, for it conjures up visions of Labour Exchanges as they were some years ago—or may be to-day, for all one knows.

These were horrible institutions, generally occupying derelict shops or dismantled factories. They were run by ignorant and supercilious bullies (male and female) who traded on their positions as Government officials and made themselves as offensive as possible to the less fortunate members of their own class. And they were haunted by queues of odorous individuals who gave one the impression that the places were the casual wards of workhouses invaded by "bread-lines" from the Embankment.

It is necessary to overcome this idea and to realise that the Appointments Department has been established for the express purpose of helping those who want an "appointment" and not merely a "job." As a matter of fact, the differentiation is just plain straightforward snobbery, and would never have been necessary if the Labour Exchanges had been properly run, and if they had been called Employment Bureaux, or some such elegant name.

Distinguishing between appointments and jobs is simply encouraging the "Class War" of which we hear so much and see so little. In fact, the Appointments Department district headquarters might well become recruiting depots for the "White Army" and the Labour Exchanges might do likewise for the "Red Army" if and when the promised outbreak of British Bolshevism blazes upon us—as it probably will not, thanks to British love of respectability.

To Help the King's Servants.

Be that as it may, the fact remains that the Appointments Department is a thing in being, and in it exists a special organisation to find employment for officers and men of the King's Services. This is a wholly praiseworthy institution in which every employer should take the keenest interest, and should assist in every possible way. And the best way of assisting it is by applying to the Appointments Department whenever an employee is wanted. Also, those who want employment should apply there, stating their special qualifications.

With that curious lack of intelligence which is characteristic of so many well-meant Government efforts, nobody seems to have taken any particular trouble to tell the world at large the particular addresses of the various District Headquarters of the Appointments Department. At any rate, one does not recall having seen the addresses in the daily papers. Possibly one might acquire them by application to the nearest Post Office, Police Station, or Labour Exchange. But the simpler way seems to be to write to the Appointments Department, St. Ermin's Hotel, London, S.W.2., and ask for the address of the nearest local H.Q.

Applications for appointments should be made, in the first instance, to District H.Q., because the people there may have on the spot the precise job which would fit the applicant. But if there happens to be nothing doing locally, or if there seems to be any doubt or delay, then the applicant should write direct to St. Ermin's Hotel.

The R.A.F. Department.

Officers and airmen of the R.A.F. will be glad to know that a special sub-department has been opened for their benefit at St. Ermin's, at Room 238, to which applications should be addressed *after*—not *before*—communicating with the District H.Q. This special department has been placed by the Air Ministry in charge of an R.A.F. officer who has not only a fine record as an organiser at home, but a distinguished career as an active-service aviator.

If anybody can make a success of the work of finding the right men for the jobs and the right jobs for the men, one feels sure that he can, and one bespeaks on his behalf the cordial co-operation of all readers of this paper.

One does not expect that he will be able to find jobs in the Aircraft Industry or in Commercial Aeronautics for all, nor indeed any, of those who want them. The aircraft factories are demobilising all their personnel much quicker than the Services are doing so, and it will be some years before many jobs will be going in that direction.

But, just as there are millionaires in a poverty-stricken country like Italy, so there are jobs of sorts opening up from time to time in the Aircraft Industry, so one hopes that the Society of British Aircraft Constructors will enjoin upon all its members the soundness of the policy of communicating with Room 238, when any jobs are on offer.

Outside the Industry.

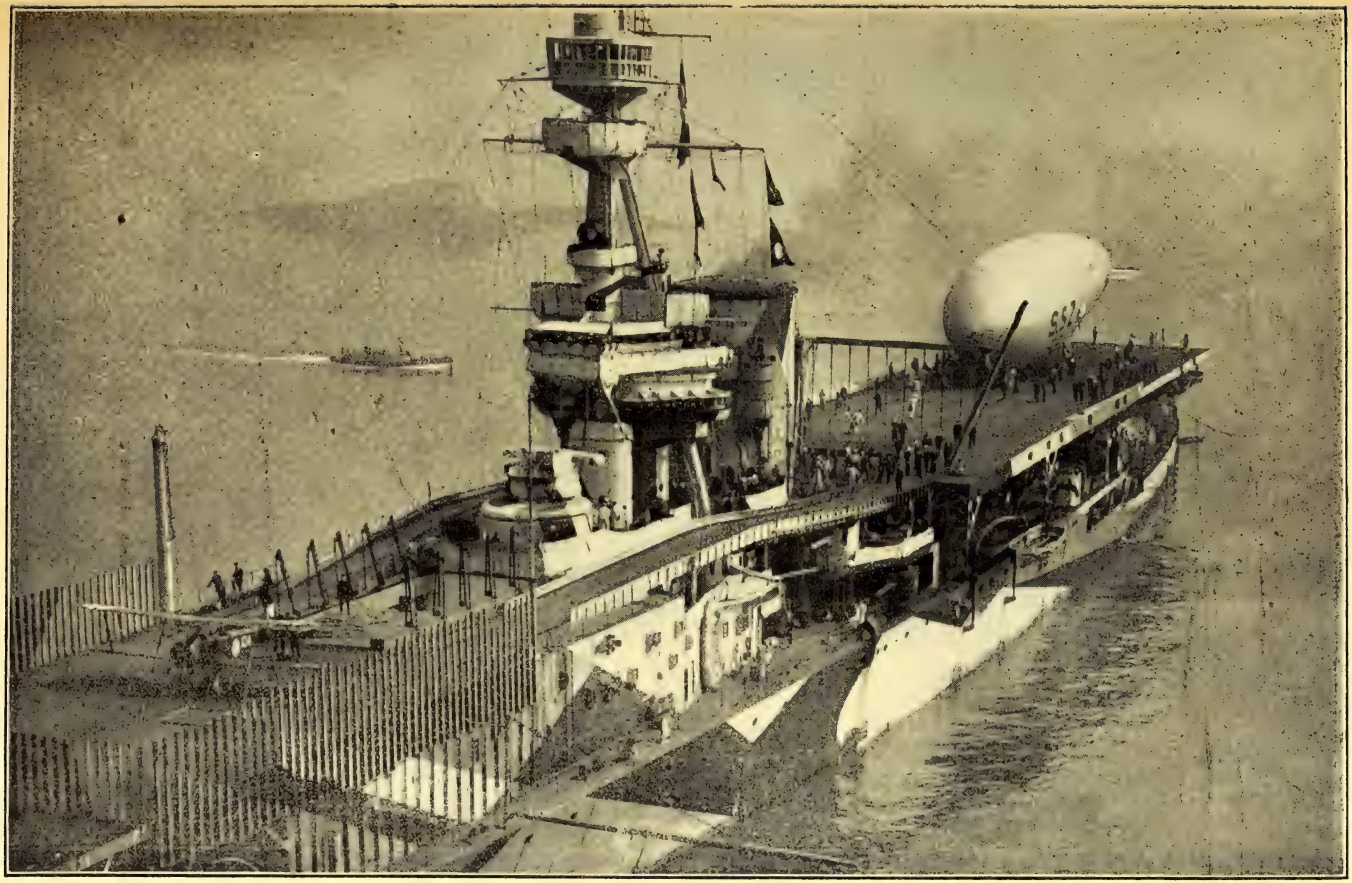
There are, however, very many readers of this paper who are quite outside the Aircraft Industry and certainly want men and women of intelligence. To them also one commends the idea of communicating with Room 238 when they have jobs to offer.

One is not quite sure whether the R.A.F. Department also deals in W.R.A.Fs., but no doubt if jobs are offered for intelligent women it will find women of the right sort among the W.R.A.F. personnel. The R.A.F. can supply trained engineers of the highest class, experienced business men, draughtsmen, designers, farmers, horsemen, fighting men, even so low down the social scale as journalists, in fact practically people for any sort of job, from those who know all about it to those who know nothing but are willing to learn.

On Behalf of the Untrained.

And it is on behalf of the latter that one would particularly appeal to employers, for the untrained are the people who have the strongest claim on our sympathies. The years in which they should have been learning how to make a living have been spent in defending those of us who were too old or too physically unfit to take a hand in "The Greatest Game of All," and it is up to us to help them to learn a trade. Therefore one hopes that any reader who knows of a vacant job which will afford a decent living wage for one of our middle-aged or elderly boys (between 19 and 25 years of age) will communicate with Room 238, St. Ermin's Hotel.

There is a great need to-day that we should keep the best of our youth in this country instead of allowing them to emigrate to foreign nations, or even to our own Colonies, for during the next years we shall want all the energy and brain which we can produce if we are to recover from the effects of the war and are to avoid becoming the financial vassal of the United States. The fact that a youngster joined the R.N.A.S. or R.F.C. in the early days of the war shows that he has energy and initiative, and probably brains. Therefore there is particularly good reason why all who have the interests of the Empire at heart—which in its lowest degree means



A SEAPLANE-CARRIER IN BEING.—The Photograph reproduced above is exhibited in large size, and coloured, at the R.A.F. "War in the Air" Exhibition at the Grafton Galleries. It shows H.M.S. "Furious," originally intended to be an Ultra-high-speed Light Cruiser, which, for various reasons, did not quite come up to Admiralty intentions, and is now rigged up as a Seaplane-Carrier. On the Left of the Picture may be seen a "One-and-a-half strut" Sopwith Biplane on the Launching Deck. The Vertical Posts round and across the Deck form a Wind Screen. It is found that Posts placed at short distances apart in this way actually break the Force of the Wind almost as much as a Solid Screen. Moreover, they appear to have the advantage of not causing a Curl-over Eddy behind the Screen as would a Solid Sheet. On the After Deck of the ship is seen one of the small "Zero" Submarine-Searcher Airships. This Deck is of particular interest in that it is rigged up to afford a Landing Place for Aeroplanes. The Cross-Bar with Vertical Cables, just abaft the Funnel, is a Screen to prevent the Aeroplanes from overshooting their mark and falling over the Edge of the Deck. This Deck has also been arranged with a kind of Wire Mattrass of Wires stretched fore-and aft and horizontally so that the Machine, on landing, slides on its Axle along these Wires, which are so arranged as to act as Brakes on the Under-Carriage. Good results were obtained with Machines fitted with Skids designed to grip the Wires instead of using Wheels.

their own self-interest—should endeavour to provide decent jobs for the youths who are now leaving the Flying Services, frequently much against their will.

Moreover, for the future safety of the British Isles it is of the utmost importance that all who have had to do with flying should remain in these Islands, so that we may have on the spot a big ready-made Air Force Reserve in training for the next war. Here the Air Ministry—by leave of the Treasury, *bien entendu*—can do much to settle for the moment the question of What To Do With Our Boys. And of that one hopes to discourse next week.—C. G. G.

The Prince of Wales Over London.

H.R.H. the Prince of Wales, K.G., visited the Handley Page aerodrome at Cricklewood, on April 7th, and made a flight in a Handley Page machine, type O/400, with two Rolls-Royce engines. The pilot was Lieut. Carruthers, R.A.F., and the other passengers were the Lady Joan Mulholland, the Lord Claud Hamilton, and Vice-Admiral Mark Kerr, R.N.

The flight lasted about one hour, and the machine passed over Buckingham Palace, the Houses of Parliament, Fleet Street, and St. Paul's Cathedral. During the flight Mr. Carruthers and Admiral Mark Kerr changed places and the Admiral piloted the machine for a time.

On landing the Prince said it had been a very wonderful flight, and expressed a desire for a flight on another occasion in the V/1500 type of machine, which is fitted with four Rolls-Royce engines. The Prince spent some time with Mr. Carruthers, and the whole mechanism was explained to him.

A Forgettable Anniversary.

In reply to those who have remarked that last week's issue of The Aeroplane omitted any allusion to the fact that April 1st was the first birthday of the Royal Air Force, one merely suggests that they should remember that there are some things which are better forgotten.

The Canadian Air Force.

It is announced in the daily Press that Canada is to have an Air Force. The subject is now being discussed by the Canadian Government and the British Air Ministry. Col. Mulock, of the Canadian Overseas Ministry, is leaving for Canada to assist the Canadian Government in regard to the establishment and personnel of the new force. Two Canadian squadrons of the R.A.F. at present training in England are to be sent to Canada as complete units.

The International Aeronautical Commission.

The following official communiqué, dated March 31st, 1919, has been received from Paris and is passed to the Press for publication :—

The Fourth meeting of the Aeronautical Commission was held on Monday, March 31st, at 3 p.m., in order to receive and consider the reports of the Sub-Committees on military, legal, and commercial and technical subjects respectively. At this meeting, in addition to the representatives of France, Great Britain, the United States, Italy and Japan, representatives of Portugal, Belgium, Brazil, Roumania, Greece, Serbia, and Cuba were also present.

The work of the Sub-Committees was not complete, but the Commission approved of the interim reports submitted. The Commission agreed to put forward to the Supreme Council proposals to be finally submitted at their next meeting by the joint military and legal Sub-Committee.

In other directions good progress was made and substantial agreement arrived at on important points in connection with the future of commercial aviation.

The next full meeting of the Commission was fixed for April 4th at 3 p.m., when it is expected that the general principles and much of the detail of an inter-Allied convention may be finally settled.

The following official communiqué dated April 7th, 1919, has been received from Paris :—

The fifth and sixth meetings of the Aeronautical Commission of the Peace Conference were held on April 4th at three p.m. and April 5th at eleven a.m.

The Commission received reports from the Joint Military, Legal, Commercial, and Financial Sub-Committee, and decided to include the substance of these reports in a report to be made to the Supreme Council early in the following week. The Supreme Council had requested the Commission to report as early as possible upon any matters which might have relation to the conditions of the Preliminaries of Peace.

The Commission further considered and provisionally approved a report of the Technical Sub-Committee. This report contained recommendations of that Sub-Committee as to the technical articles which are to be included in the International Convention and as to the regulations to be contained in annexes to the Convention upon the following matters :—(a) Marking of aircraft; (b) Certificates of airworthiness; (c) Log-books; (d) Rules as to signals, rules of the air, regulations for air traffic on and in the vicinity of aerdromes.

With regard to the marking of aircraft the Sub-Committee have recommended a system of marking by capital letters, of which the first letter will represent the national mark of the country and will be followed by a group of four capital letters pronounceable if possible, each group containing at least one vowel. A complete group of five letters is to be used as a call sign in making or receiving signals by wireless.

In the case of aeroplanes the marks are to be painted once on the lower surface of the lower main planes and once on the upper surface of the top main planes, and also along each side of the fuselage. In the case of airships and balloons the marks are to be painted on both sides. The height of the marks must be equal to four-fifths of the width of the wing in the case of aeroplanes, and in the case of airships at least one-twelfth of the circumference at the maximum diameter, but they need not exceed 2½ metres in height. They are to be painted or affixed in black on a white ground.

The main conditions governing certificates of airworthiness include approval of design, flying trials of the first of the type, approval of workmanship and materials, and equipment with suitable instruments.

The recommendations as to log-books contemplate four different kinds of log-books—viz., journey log, aircraft log, engine log, and a signal log. The first of these must be kept for all aircraft and is to contain particulars of the crew and passengers and a description of the journey, but need only be kept in the case of international flights. The last three are only obligatory in the case of commercial aircraft and are to contain entries of a technical character; the aircraft and engine log including a record of the life of the aircraft and engine.

The rules as to lights are modelled to a certain extent upon similar rules in use at sea, and there are detailed rules as to signals in the case of aircraft wishing to land at night and in the case of aircraft in distress. These include the use of Very's Lights and certain visual or wireless signals.

The rules of the air follow the rules of the sea in many respects, especially in the case of the passing rule when two aircraft are meeting. In that case each must alter its course to starboard.

Regulations for air traffic on and in the vicinity of aerodromes contemplate the use of coloured flags indicating whether the circuit which an aircraft about to land may find it necessary to make should be clockwise or anti-clockwise. There is also a valuable provision for dividing every aerodrome into three zones when landing upwind. The right-hand zone is to be the taking-off zone, and the left-hand zone the landing zone, and between the two there is to be a neutral zone into which, after its landing run, an aeroplane will immediately taxi.

In the general provisions at the conclusion of this code there is a rule providing for every aircraft which manœuvres under its own power on the water conforming to the regulations for preventing collisions at sea.

The Industrial Reconstruction Council.

The Rt. Hon. J. H. Whitley, M.P., has accepted the office of president, and Lieut.-Col C. L'Estrange Malone, M.P., the office of chairman of the executive committee of the Industrial Reconstruction Council.

The Industrial Reconstruction Council, which was founded by Mr. Ernest J. P. Benn, is a propagandist body having for its object the awakening of national interest to the need for a complete system of Industrial Self-Government, based on the principles of the Whitley Report.

The Royal Aeronautical Society.

At the annual meeting of the Royal Aeronautical Society, which was held at 7, Albemarle Street, Piccadilly, Major-General R. M. Ruck, who presided, said that this would be the last occasion on which he would address the annual meeting from the chair.

The recognition of their work by His Majesty, who had conferred on the Society the dignity of "Royal," was deeply appreciated. Their membership, which now reached 1,100, had increased five-fold, and their income ten-fold. They had striven to promote the cause of civil aerial transport, and welcomed the advances which had been made during the war in aeronautical science. The council strongly urged the foundation of local branches.

The ballot for 10 vacancies on the council resulted in the election of Mr. A. E Berriman, Lieut.-Colonel A. Burgoyne, M.P., Lieut.-Colonel T. R. Cave-Browne-Cave, Sir M. D. Chalmers, Sir R. Hadfield, Lieut.-Colonel A Ogilvie, Lieut.-Colonel M. O'Gorman, Mr. F. Handley Page, Mr. G. Holt Thomas, and Lieut.-Colonel H. T. Tizard.

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SAMSON versus "THE AEROPLANE."

On April 4th there was heard before Mr. Justice Darling and a special jury an action brought by Capt. William Leopold Samson, D.F.C., R.A.F., brother of Col. C. R. Samson, D.S.O., the famous aviator, to recover damages for alleged libel against the publishers, printer, and editor (C. G. Grey) of THE AEROPLANE. Defendants denied that the statements complained of were libellous or that they referred to the plaintiff.

Sir E. Marshall Hall, K.C., and Mr. H. Cassie Holden (instructed by Mr. G. R. Cran), for the plaintiff; Mr. Lewis Thomas, K.C., and Sir Hugh Fraser (instructed by W. W. Box and Co.), for the defendants.

Sir E. Marshall Hall said the plaintiff was 37 years of age, was a member of the Bar, had a high reputation as an airman, and possessed the 1914 Star. When the war broke out he gave up his Bar practice and obtained a commission in the Royal Naval Volunteer Reserve. He was attached to the Royal Naval Air Service, and was engaged with them at Ostend in 1914. After the evacuation of Ostend he took part in several armoured car engagements.

Returning to England in 1915, he in March of that year went to the Dardanelles, and took up a position as observer in the Air Service, doing important work bombing the enemy. At Smyrna his plane was wrecked, and he and the pilot were not rescued until after some hours. He was injured and went to a military hospital and was then invalided home. In October, 1915, he returned to the Dardanelles, and remained there till the evacuation. In November, 1915, he went to Adrianople, and took part in bridge bombing, flying 180 miles, of which 60 miles were over the sea. From April to September, 1916, he was in German East Africa. In October, 1916, he joined the ship "Ben-my-Chree," and was engaged in Egypt, Palestine, and Syria, taking part in daylight raids. In January, 1917, the "Ben-my-Chree" was sunk by shell-fire in harbour, he being on board at the time.

In February, 1917, he came back to England, and was stationed at Eastchurch, and took a qualifying course as observer. In March of that year he was gazetted, and a letter was sent from the Admiralty thanking him for distinguished services. In June, 1917, he joined No. 6 Wing of the R.A.F. in Italy, and took part in the expedition for bombing the Austrian fleet, when six planes were damaged and two were sunk. He was picked up in the sea. Later in 1917 he went to Corfu for the French Government, and in July, 1918, he was attached to the Royal Air Force headquarters staff at Felixstowe. He then took part as an observer in attacks upon submarines.

Early in October he accompanied Capt. Webster, a pilot from Felixstowe, in a Porte flying-boat, and an extraordinary thing happened. Although he had been continually flying, on this flight he suffered for the first time from air-sickness. But in spite of that, when the pilot called his attention by the prosaic method of kicking him in the back to the presence of submarines, he pulled the lever which fused the bombs and released the bombs, and it was confidently believed, although there was no actual proof, that a submarine was sunk. When he mentioned the incident of his sickness on returning to Felixstowe it caused a good deal of chaff in the mess. On January 1st he was gazetted for the Distinguished Flying Cross, which was only given for acts of valour in face of the enemy.

Then, on Jan. 15th, there appeared in THE AEROPLANE the libel complained of, under the headline "The Porte Boats."

It was as follows:—

EARNING A DECORATION

Incidentally the big boat people tell a delightful story of an R.A.F. staff officer who much desired a decoration of some sort. Although he scrupulously avoided active service of the more dangerous kind, he regarded the big boats as safe enough even for him. So he went forth bravely as an observer to search for submarines. Now be it noted, for all its size, a big boat can roll and pitch at times in a manner disconcerting to one of delicate stomach. So it came to pass that when, after some time, a real Hun submarine was sighted, the gallant officer was in the preliminary agonies of air-sickness, and did not observe it as a good observer should. The pilot, being an old hand at the game, spotted the submarine, and jerked the elevator controls to attract the observer's attention. Unfortunately, the observer, being so intent on his own internal affairs, did not recognise the signal, and regarded the jerk merely as another unkind stroke of fate. The pilot steered skilfully for the submarine, and, when almost in position, again jerked his controls, this time more forcibly, to signify that it was about time for the observer to get busy. Again the jerk merely aggravated the observer's discomfort, and nothing happened.

By this time the pilot realised that the observer was not paying proper regard to his commanding officer, and to secure his prompt attention gave a mighty heave at the elevator, which swung the big boat up and down like a rocking-horse. That did it. The cataclysm befell. In his paroxysm the observer clutched at the first thing near him. It so happened that the something which he gripped happened to be the bomb-release lever. And as his soul was rent within him two hefty bombs whistled through the air and deposited themselves on or near the submarine. Things spread themselves over the surface of the water, and were duly certified as evidence that an enemy submarine had been sunk. Things also spread themselves over the interior surface of the boat, but that is another affair. It suffices to say that the boat duly returned, and that in due official time the observer mounted the blue-and-white ribbon of the D.F.C. "for gallantry in the face of the enemy." Officially, one gathers, the top of a submarine commander's head is the face of an enemy for purposes of donating decorations.

Commenting on the article, Sir Edward said its offensiveness and intention were beyond question. The plaintiff said that he was the "observer" in question, and that the words meant that he was a coward and a shirker and unfitted to hold His Majesty's commission, and that he had been brought into public ridicule and contempt.

EXCERPTS FROM THE EVIDENCE.

Captain W. L. Samson was sworn, and was examined by Sir E. Marshall-Hall.

After some evidence concerning Captain Samson's service, Sir Edward Marshall-Hall continued:—

Now, in 1918, were you attached to the staff of the No. 4 Group at Felixstowe?—Prior to that I was on the "Campania" for six months.

Did you make a number of anti-submarine flights as observer in bombing machines?—I did.

I am coming particularly to an occasion early in October, 1918. Did a squadron go out?—Yes, of five boats.

Were you in the leading boat?—Yes.

Did you have sole control of the bombs?—Yes.

Were you sitting in front?—Yes, in the cock-pit.

During all the years you have been flying, have you ever suffered from air-sickness before?—Never.

On this occasion were you seized with a violent attack of air-sickness?—I was.

Is the pilot above you or below you: is his line of vision above or below yours?—I think a little above if anything.

How can he communicate with you?—Kicking me is the simplest thing.

That would attract your attention?—Yes.

Would he get a better chance of seeing a periscope before you or not?—It depends upon where it was.

If it was straight in front.—He might, because he is looking straight ahead along the horizon the whole time.

While you were air-sick, was your attention attracted by the pilot?—Yes.

Did he, in fact, call you?—Yes.

Will you tell the story exactly of what happened?—The pilot kicked me. I presumed he was trying to attract my attention to something. I looked about and saw the periscope of the submarine. I knew what was wanted. I prepared to bomb the thing when we got over it.

What did you do?—I adjusted the sight over the front of the machine. It was a complicated bombing sight. I also fused the bombs. There is a lever inside the boat to fuse the bomb, and there is a plug to release them afterwards. I fused the bombs and got ready to bomb when in a position to do so. When I got the sight which I considered bearing on the thing, I dropped both the bombs. I saw them drop. I believe we hit it, but I will not be sure. Both the bombs exploded.

As a matter of fact, was there any evidence on the surface of the water that you had successfully bombed the submarine?—I could not see anything; it was a rough day.

Although you were air-sick, did that interfere with the discharge of your duties?—Not in the least.

When you came back, of course this matter became the subject of conversation?—Yes.

Did you yourself tell your friends that you had been air-sick?—Certainly.

Was the story so far as your air-sickness was concerned known in the mess?—Yes, known everywhere.

Who was your commanding officer?—My brother.

Who was under him?—Lieut.-Colonel Wardle.

On January 1st, were you gazetted and awarded the Distinguished Flying Cross?—I was.

Did you see Mr. Grey when he was down there?—Yes. I was staying at the same hotel. I live there.

Did he come to the mess?—I do not know. I did not go often to the mess. I was a casual visitor.

Whilst he was there, was this story current or not?—It had been current all the time. Everyone knew it.

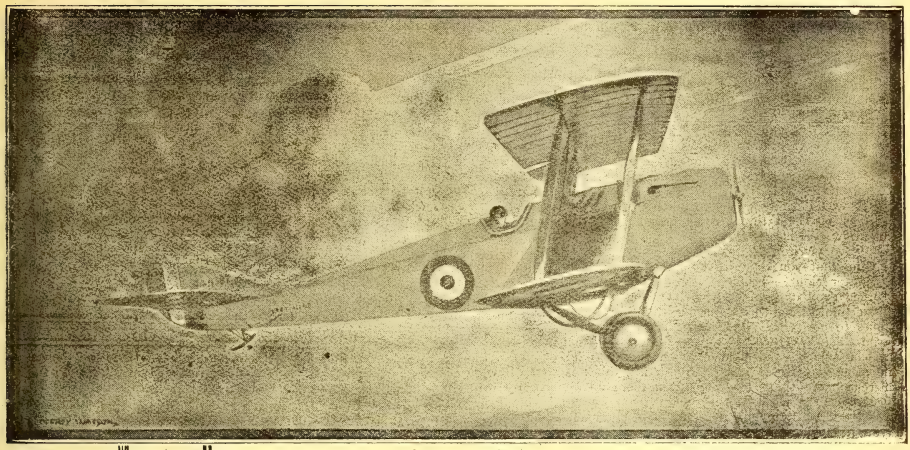
Mr. Justice Darling: When did you say he was staying at Felixstowe?

The Witness: At Christmas.

Sir E. Marshall-Hall: December 21st to 28th, 1918. Is the paper, THE AEROPLANE, always taken in at headquarters?—Yes.

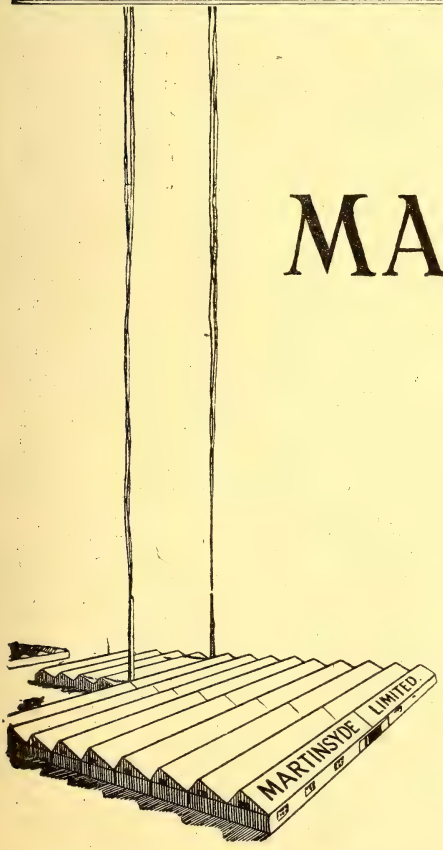
Is a copy put on the table?—Yes, on every table. Every officer has one.

On January 15th was your attention called to this paragraph?—I picked up the paper and read it myself.





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So far as you are concerned, did you take it as applying to you?—Certainly.

Did it cause you considerable pain?—It made me very angry indeed.

Incidentally, the big-boat people tell a delightful story of an R.A.F. Staff Officer." First of all, was this Porte known as a big boat?—Yes.

Are you an R.A.F. Staff Officer?—I was attached to the Staff.

And you instructed your solicitors to issue a writ for libel?—Yes, almost as soon as I read the article.

CROSS-EXAMINATION BY MR. LEWIS THOMAS.

You read the article on the 15th?—I do not know what day it was. It was the day we got the paper.

It is issued on the 15th, and you would get it on the 15th?—I do not know. It is posted to us, and we get it every week.

Did you ever write a letter to the proprietors of THE AEROPLANE saying that you thought it applied to you and would they put the matter right?—I did not.

You fired away and issued a writ at once?—Certainly.

Did you think that was a proper thing to do?—I had only two things to do.

Did you think that was a proper thing to do, as a member of the Bar—as your learned counsel has referred to it?—Certainly.

If the other side were wrong, do you not think it would have been a reasonable thing to have given them an opportunity of putting the matter right if they were wrong and it did apply to you?—I do not know about that.

Do you not think it would have been fair to write and say, "If this applies to me, I must ask you to express your regret and retract"?—I did not think so at the time.

You did not do so?—I did not.

The article itself contains no name whatever of Captain Samson?—No.

Your name is not mentioned?—No.

You know that the people who read this paper, even if it could apply to you—not that it did apply to you—unless they knew you, could not connect you with the article, could they—Oh, yes!

What! If they did not know you?—Certainly. The thing was common talk.

I will deal with common talk in a moment or two. As a matter of fact, was your experience of air-sickness in the first half of October, 1918?—This was the first time I had been sick in the air.

I am not putting it offensively. I am not suggesting there is anything which reflected upon you.—I am not ashamed of being sick at all.

I do not see why you should. I do not see why you should have complained if it was mentioned by name that you were air-sick.—I am not complaining of that, but of the first part of the article.

I was asking for the date. I asked you whether it was the early part of October, 1918.—I think this occasion was the 10th or 11th.

Then you agree with me?—Certainly.

The first half of October?—Yes.

When you came down, is it true that you told every one in your Mess?—We have not got a Mess. I told them in the Headquarters. I came straight back and I told them all that I had been sick.

Did you regard it as a joke?—I do not know about a joke.

Did you regard it as a joke?—I cannot answer that at all. I mentioned as a fact that I had been sick. There is nothing disgraceful in saying it.

There was nothing disgraceful in being air-sick?—Certainly not.

Some people have passed across the Channel (they are going by tunnel now) who have been sea-sick. You would not think them discreditable because they had that misfortune?—No.

You would not necessarily think them cowards?

Mr. Justice Darling: I think you may take it that probably Julius Cæsar and William the Conqueror were sea-sick when they crossed the Channel.

Mr. Lewis Thomas: I understand William the Conqueror was so knocked up that when he got to land he fell down. I understand that whenever Lord Nelson went to sea he was sea-sick and it was not discreditable to Lord Nelson.

Before October 10th or 12th, what were your duties in the Felixstowe command. Were you Law Officer and Recreation Officer?—Yes, and physical trainer.

I am not depreciating your services, but, as a matter of fact, before October 10th, you had not been up for some little time, had you?—I had been up in July.

Therefore, there was nothing very surprising if you went up after some interval without having been up, that you should be air-sick?—I believe I am the only person who has been known to be sick in these boats.

But you have heard of other people being sick?—I have not heard of anyone being sick in these boats.

I did not ask you that. You have heard of other people being air-sick.—Yes.

You told people when you came back to Headquarters. Did you regard it as a joke?—I cannot say I regarded it as a joke or not.

Mr. Justice Darling: He said he was a Recreation Officer (To the witness). You said you were Law and Recreation Officer. Was it a combined post, or is Law different from Recreation?—I combined the two.

Mr. Lewis Thomas: (To the Witness). I got to the date of about October 10th. Before the beginning of December, had whatever incident had happened been weaved into what one may call a yarn?—I do not know.

Had you not regarded it as a joke that you dropped two bombs even when you were air-sick, and told it as a yarn and spread it about the place?—Even if I had——

Let us have, Yes or No.—I do not know.

Mr. Justice Darling: Did you hear people laughing about it down at Felixstowe?—Yes.

Mr. Lewis Thomas: It is so easy to say, Yes.

Mr. Justice Darling: It depends upon how you ask him.

Mr. Lewis Thomas: I will try and emulate my Lord. You will feel that I am not hostile to you?—Quite.

The article says that there was a yarn going about there?

Sir E. Marshall-Hall: "A delightful story," they call it.

Mr. Lewis Thomas: My friend and I do not think the story so delightful, but you were the author of it. Had you known sometimes a little grousing at Headquarters there about the Staff Officers?—I did not personally.

No, not you—you would not "grouse."—I did not know there was any.

Has there been, probably quite unjustifiably, comments that Staff Officers got soft billets?—Quite likely.

And that they got honours with less difficulty than other people?—It is quite possible.

Mr. Justice Darling: Honours easy, do you mean?

Mr. Lewis Thomas: We will cut again, my Lord.

You have heard comments, I suppose, of Staff Officers getting things more easily in the way of decorations than the hard-working observer captains?—I have heard comments and grousing about Staff Officers all over the world the last four-and-a-half years.

Mr. Justice Darling: Were you a Staff Officer or not?—I was attached to the Staff.

Mr. Lewis Thomas: Think before you answer my Lord, if you will forgive me. Are there only two Staff Officers with the Distinguished Flying Cross? You are not one. Be careful.

Capt. Samson: I cannot tell you how many there are. I cannot tell you how many there are. I am not in the Air Force List as a Staff Officer. I am only attached.

Mr. Lewis Thomas: Then you are not a Staff Officer?—No, I am attached to the Staff.

The Adjutant of the regiment is attached to the regiment, and he is, so to speak, part of the staff of the regiment, but he is not a Staff Officer?—Quite so. I am not a Staff Officer.

And throughout the monthly Air Force List, you are put down as Captain Observer, and not as a Staff Officer at all?—Yes.

So that when this article begins, "Incidentally the big boat people tell a delightful story of a R.A.F. Staff Officer," anyone who knew you would know you could not be the Staff Officer referred to?—That is nonsense. Everyone down there regards me as a Staff Officer. I am a Staff Officer except——

Except you are not?—Yes, except I am not.

You have admitted twice you are not a Staff Officer.—I admit that, but I am attached to the Staff, and in the eyes of the ordinary person I am a Staff Officer. It is the same thing.

The ordinary person outside may be ignorant, but the people in the No. 4 Headquarters Group would know you were not a Staff Officer?—If you ask any one in No. 4 whether I am a Staff Officer they would say, yes.

And say so wrongly?—Yes, but they would say yes.

It could not apply to you?—Of course it would apply to me; it could not apply to anybody else.

It would be untrue to suggest you had not had considerable foreign service?—Yes, I think so.

You had had considerable foreign service?—Yes, nearly four-and-a-half years.

You had actually been mentioned and commended for your conduct when the "Ben-my-Chree" was sunk by shell-fire, were you not, in 1917?—Yes.

You had actually taken part in the night-bombing expeditions in Turkey?—Yes.

You had been present when the bridge at Adrianople was bombed?—Yes.

You had taken part in other night-flying, had you not?—Yes.

Therefore you could not have been described as a person who had avoided foreign service?—I was described as such.

But you could not have been described as such?—No; it was a lie.

And therefore anyone who knew you would know it could not apply to you if it was a true story?—No one who was with me throughout the war and knew that, but other people could not have known it.


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You, as a matter of fact, got the Distinguished Flying Cross for bombing at Adrianople and your other foreign service.—I do not know actually what I got it for. I believe the original recommendation is there.

It is for service in the face of the enemy?—Yes.

As distinct from what I may call good service in the Air Force, but not in the face of the enemy. There is another thing for that?—Yes, the Air Force Cross.

Mr. Lewis Thomas: You were not gazetted for the Distinguished Flying Cross until January 1st?—No.

And you say that Mr. Grey, the editor of the paper, was at Felixstowe up to December 28th?—I am not certain of the date. He was there over Christmas. I actually saw him leave the hotel in a motor on the 28th, I think, but I do not know.

That is near enough for my purpose. Did you read this article at page 203 yourself?—I did. I read the paper every week.

And did you see the earlier part of the observation in the paper my friend read: "Certainly the fights they put up against superior numbers were among the great performances of the war, and their crews thoroughly deserved the comparatively few D.F.Cs. distributed among them"?—I read the whole number.

So that there was no attack upon the Air Force or upon people who use these particular flying-boats, the Porte boats?—No.

Then there are these differentiations that you are not a Staff Officer——?—I am a Staff Officer to all intents and purposes.

Would you wait for the question? Why, if there are these differentiations, you not being a Staff Officer and you having been commended for foreign service and having got your D.F.C.——?—Sir E. Marshall-Hall: The word is not "foreign" but "active" service.

Mr. Lewis Thomas: Active service is the more dangerous sort.

If you knew those differences showed it could not be you, why did you put the cap on your head?—Because one does not always believe true things. If a thing is untrue, it does not always follow it does not refer to one.

Why did you put the cap on your head?—Because there was no one else it could refer to in my mind.

Mr. Lewis Thomas: When you were gazetted, were there 100 others gazetted at the same time?—Just about, I think.

On the very same date, January 1st?—Yes.

Re-examined by Sir E. Marshall-Hall.

I think your brother wrote this letter: "Dear Grey, I have just been shown The Aeroplane of January 15th, page 203, which talks about 'Earning a Decoration.' This cannot refer to anybody else except my brother, W. L. Samson, who is a proper qualified observer and has served since August, 1914. I think your article is rather unfair and that you have got a distorted account. My brother was awarded the D.F.C. on January 1st, 1919, for the following:—'For his continuous long service as an observer and for carrying out the second Boat attack at low altitude against very heavy anti-aircraft fire on the Railway Bridge over the Mantze River, near Adrianople.' On June 23rd, 1918, when carrying out a reconnaissance in the Mediterranean in the Gulf of Aivali in an aeroplane the machine came down in the sea through engine failure and he and the pilot were 1½ hours in the water. He went through the Dardanelles and took part as observer in many flights. He also served in many fights in armoured cars in Flanders. He took part as observer in December, 1916, in a seaplane in a very low and successful bomb attack against heavy fire on the Chykaldere Railway Bridge in Asia Minor. In 1917 he started as observer in a seaplane carrying a torpedo in an attack on Cattaro. In 1917 when H.M.S. 'Ben-my-Chree' was sunk by gun-fire he received a letter from the Lords Commissioners of the Admiralty commending him for the gallantry he displayed. He has since taken part in very long sea patrols in 1918 as observer in the Grand Fleet. So altogether you can see that you have cast aspersions on an officer who has done continuous good work and has not been an office-wallah. I hope that you will without mentioning names publish an apology, stating some extracts out of this letter. I am yours, C. R. Samson.'" This was his reply: "Dear Samson, I'm sorry if your brother identifies himself as the hero of the flying-boat story. There are heaps of flying-boats all round the coast, and heaps of Staff Officers who have got D.F.Cs., which heaps of them don't deserve, so why fasten the yarn on to him? It was told me as a yarn, and it was much too funny to be confined to private circulation. Any effort to explain things would probably make it worse, but if you can suggest anything I shall be glad to hear it. Hoping all is well with you, 'Very truly yours, Charles Grey,'" and you issued your Writ two days after that?—Yes.

Only one other question. Were you to all intents and purposes a Staff Officer at this time?—I was.

Lieut.-Colonel Charles Edward Wardle, in reply to Mr. Cassie Holden, said he remembered Mr. Grey, being at Felixstowe just before Christmas and giving him an invitation to visit the station, which he did. Witness had read the article in The Aeroplane, and considered it referred to the plaintiff.

In cross-examination, the witness agreed that a yarn was being told in the station of some one having been air-sick, and that it was more or less treated as a joke, and as being nothing discreditable. He saw nothing to make him think that Mr. Grey disliked any member of Group 4. Re-examined by Sir E. Marshall-Hall, the witness said the story of air-sickness was circulated with regard to Captain Samson. Captain Samson was not on the Staff, but was attached to the Staff of No. 4 Group.

Major Arthur Thomas Barker, Squadron Commander, Felixstowe, said he had been pilot on occasions when the plaintiff had acted as observer. He was a regular reader of The Aeroplane, and considered that the article in question referred to Captain Samson. He knew of no other officer to whom the article could refer, and had always regarded the plaintiff as a Staff Officer until that afternoon.

In reply to Mr. Lewis Thomas's questions in cross-examination, the witness had thought worse of Captain Samson after reading the article. He had read the story, and he would not like it circulated that he himself had been sick in the air, although he might have told such a thing about himself.

Re-examined by Sir E. Marshall-Hall: My friend asked you whether you thought any worse of him. Would you have thought worse of a man who was said to have scrupulously avoided active service while anxious to gain a decoration?—I certainly would.

Captain Alexander James Barber, Captain and Quartermaster of Headquarters, No. 4 Group, gave evidence that in his opinion the article referred to Captain Samson.

Captain James Grimaldi, an R.A.F. doctor, having given evidence to the same effect, the depositions of Col. C. R. Samson, D.S.O., taken on commission were read.

Extracts from Counsels' Speeches.

This concluded the evidence for the plaintiff and, no evidence being called on behalf of the defendant, Sir E Marshall-Hall addressed the Jury on behalf of the plaintiff. He said:—The defendant refuses to go into the witness-box and tell us to whom it (the article) did apply. We are not bringing an action for libel because The Aeroplane published a story that Capt. Samson had been air-sick. That is not a libel. That is not the libel that is complained of. Once you admit that this refers to Captain Samson, it becomes a most serious libel, because it says that the man who is referred to in the libel was a Staff Officer who was desirous of getting a decoration of some sort: that he had scrupulously avoided active service of the more dangerous kind: that he thought the big boats were safe enough even for him, and he went forth bravely to search for submarines. The suggestion is that the man was a coward: that he "wangled"—my Lord has reminded us of the expression which has now become current—a decoration which he never deserved, and it is a disgraceful thing. You have a racy story, too good for private circulation. It may be a good story, but why, regardless of a man's feelings, should you put that in your paper? Once you admit, as you must admit, that this story was about Captain Samson, the mere fact that Captain Samson had told the story of his being air sick, and had treated that lightly does not justify them in saying the man who was air-sick was absolutely deprived of his power of dealing with the bombs. I do not want to read the libel again.

We all want to get the case finished. It is a dastardly libel. If Mr. Grey had had the courage to go into the witness-box, and say, "I did not mean to refer to Captain Samson," it would be another matter, but he knows he cannot do that. Having brought us to trial here, he does not go into the witness-box. We know, as a matter of fact, that he was at Felixstowe between December 21st and 28th. Do you not think he got this story as part of an excellent story told at the Mess, and for some reason best known to himself he decided to publish it? Take his own explanation, if you like: the story was too racy to be kept for private recollection, and he puts this story into his paper to help to sell the paper, and which contains the grossest possible innuendo on an officer and a gentleman.

It is a dirty story to tell at any time—it is a nauseating story to talk of a man being sick on the head of a submarine commander.

Mr. Lewis Thomas: It does not say so.

Sir E. Marshall-Hall: No, it does not cross the i's and dot the t's. My friend says it does not mean that. What does it mean? "Officially one gathers the top of a submarine commander's head is the face of an enemy for the purpose of donating decorations." What does that mean? It means he was sick upon the top of the commander's head. It is a somewhat dirty suggestion.

Mr. Justice Darling: I must say, before you say that, that I think you should see they do say he was sick, but I think they limit his vomiting to the inside of the boat. He released the bombs. I suppose that if they fell on the head of the commander

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of the submarine, technically the top of his head would be his face. That says the top of the commander's head is his face.

Sir E. Marshall-Hall: Then that is the face of the enemy. What was supposed to hit the German commander was not what I suggested. However you wrap up the pill with the sugar around it, there is the nasty stuff inside. Here is this man who writes a racy story, as he calls it, but it is a serious libel upon the plaintiff. It is said that he has "wangled" a decoration he does not deserve.

Gentlemen, I do not ask for vindictive damages—I do not want to make money out of this, but I suggest you should award some such sum of money in the way of damages as will show your disapproval of this class of literature, and show the public that whatever suggestion or innuendo was contained in that libel with regard to Captain Samson's cowardice or fear on active service was entirely without foundation.

Mr. Lewis Thomas: I submit to you that this is one of those actions that ought never to have been brought if the ordinary course had been taken by the plaintiff in this case of writing to the editor of this paper and saying, "I am taken to be the hero of this story. If that is so, I want you to apologise and say I am not and make a suitable apology in the paper." He does nothing of the sort, but what takes place is this. On January 15th this journal is published; the story is read on the 16th.

The plaintiff's brother writes the letter which my friend has read, setting out what everyone admits—the good service on the part of the plaintiff in this case, Captain Samson, and saying to the editor of the paper that it was not fair in substance to put this story so that it falls upon the plaintiff. What does Mr. Grey, the editor of the paper, do? He receives a letter from the plaintiff's brother, addressing him, "Dear Grey." He writes back to Colonel Samson, the brother of the plaintiff, "Dear Samson"—so that they are on friendly terms—and says in substance, "It could not be taken to be your brother. If I were to put anything in the paper now it would make it worse and fix it upon him. What do you suggest I should do?"

That letter is written on the Saturday. No answer was sent by the plaintiff, or his brother, but he issues his writ. That is the only answer to the letter that Mr. Grey got explaining that he would do anything in reason, and asking them what they suggested he should do. So that, gentlemen, if Captain Samson had thought or had felt that his honour had been attacked in any way, he could have had it rehabilitated immediately. But the true position is that his honour never has been attacked, and it all occurred as the writer of the article, Mr. Grey, says. He had been spending his holiday down at Felixstowe, and, being the editor of The Aeroplane, an influential journal dealing with aeronautical matters, he was therefore busying himself on matters of aeronautics and aeroplane construction and flying and so on. He is invited by Captain Wardle over to the Air Station. He is taken over with two other gentlemen and entertained to tea at the Air Station, and it is admitted that this story or yarn was being told about the place with regard to somebody who had been air-sick and who had "wangled" or suggested an honour out of it. The story apparently was that this gentleman (the plaintiff) had been air-sick when out on an expedition. No one suggests that this article applies to him.

Mr. Grey, through me, is prepared to submit, and always has submitted, that it did not and was not intended to apply to Captain Samson. My friend asks why did we not put Mr. Grey in the box. I will tell you why. It was because the issue in a case of this sort is not whom the writer in a journal, if he makes a statement, intends to hit, but it is, who is hit by it, and who in substance the reader surmises it was intended to hit? If I put one hundred editors into the witness-box to say it was not intended to hit a particular man, it would not have advanced the case a bit, because it is no answer to say you did not intend to hit that particular man.

My learned friend talks about it being a nasty story. All I can say, gentlemen, is that my learned friend cannot have read the article. It says that the person in question got a D.F.C. for gallant service in the face of the enemy, and when a man drops a bomb on the head of a German submarine commander we now know that is the face of the enemy, as the article says. It may be a cheap joke, but my learned friend, having so weak a case here, has to distort it, and to suggest that it was a vulgar way of insinuating that this man referred to in the article had been sick on the head of the German submarine commander. Nothing of the sort, gentlemen.

The defence from first to last has been that it does not apply to the plaintiff, and we do not suggest that, even if the story were true, it could apply to the plaintiff, and, even if it could apply to the plaintiff, we do not suggest that the words are true. It is a boiling together of two yarns. What is the meaning now? It is admitted now that Captain Samson is not a Staff Officer. The article speaks of a Staff Officer who in the colloquialism of the Army, Navy, and Air Forces, had been "wangling" an honour, although he was afraid to go on active service of a dangerous sort in the face of the enemy. If I could say it in more handsome terms, I would. I say that no one is entitled to cast the slightest aspersion on the plaintiff in this case, and no one has done it, or to say that he has not done good service for his country in Egypt and Italy and the Dardanelles and been commended for it and got his D.F.C. for active service in the face of the enemy and for his bombing exploits at Adrianople Bridge. All that is known, and everybody at that Air Station knew it.

What do we find? There is a story going about with reference to somebody being sick in a flying-boat—the usual story about Staff Officers "wangling" decorations for themselves. Everybody at that Air Station knew perfectly well that this gentleman, Captain Samson, was not a Staff Officer. Everybody knew on January 15th that this man had got his honour for distinguished service in the face of the enemy, for low flights at Adrianople and other places, and his bombing exploits on the enemy. Everybody who knows Captain Samson knows that, and knows that this article could never have applied to him.

But if he picks up a paper and, being a barrister, thinks it right to bring an action for libel without even writing first of all a letter before action, and goes about interviewing his friends and asking them "Have you seen this about Joe, or Tom, or Dick, or Harry? Just read that?"—it is not very difficult to get them to say to him, "Oh, yes, this applies to you." But, gentlemen, you have not had called before you Captain Webster, the pilot who was in charge of this particular flying-boat on this occasion, and who is supposed to have kicked Captain Samson. He is not called to tell you what took place, but other people have been called. I do not know why they have been called. It is not for me to comment upon it possibly, but we have not seen Captain Webster.

Those being the facts, what has Captain Samson got to complain of? This article speaks of a Staff Officer of the Flying Service. In the first place, there are two Staff Officers of the Flying Service who have got the D.F.C., and Captain Samson is not one of them, and as regards this gentleman, I say it could not have applied to him. It is irrelevant that it was not intended to apply to him, but it could not apply to him and did not apply to him, and the cap, I submit to you, does not fit his head, although he is apparently so anxious to put it on.

You have seen people who knew it could not be true about him called, and you have heard the evidence they gave. But who is there who has ever heard of Captain Samson and read that article who could have fitted the cap on to Captain Samson's head? Gentlemen, we know why actions are brought without any letter at all before action being sent. It is because if a letter is sent before action, the plaintiff then meets his adversary personally, and if his adversary finds he has made a mistake and that he is wrong, an apology is at once tendered and published, and there is no action ever brought, and no damages, and no bill of costs for the plaintiff's solicitor.

No one but Captain Samson, through his solicitor, fits the cap on his head. He fits the cap on himself, and he says, "Here is a gross outrage on me." Nothing of the sort, gentlemen. This is an attack upon the theory which is criticised as being in practice, that Staff Officers may get a better amount of decorations than other people who are not Staff Officers.

The second point is, that this gentleman has heard between December 21st and 28th of the story of someone being air-sick when he is dropping bombs on the top of a German submarine, and he fits the two together. Notice this significant fact, that my friend says that it must and could only have applied to the plaintiff. This story is heard on December 28th, and this gentleman is not actually gazetted to the D.F.C. until January 1st. How therefore could this have applied to him, when the story which has been built up is a story which is current on December 28th? I repeat, although Captain Samson got the D.F.C., he was not gazetted for it until January 1st, and I submit to you, gentleman, that this is one of those cases which ought never to have been brought.

Even if you think it does refer to the plaintiff, gentlemen, what harm has been done to him to tell a story of this sort? No one has ever imputed any want of gallantry to the plaintiff, and if he wanted to resume his practice at the Bar, and to come and put on a wig and gown, and practice in these Courts, there is nothing to prevent his doing so. No one has ever suggested it, and no one but a perverted mind would have read any such thing as that it could possibly have applied to Captain Samson.

If you think there is something which my client is responsible for, what damage has the plaintiff sustained? None, except by bringing this action, and getting the publicity of it, and putting the cap on his own head. If you think he is entitled to damages, I will not say a single word on it, because my case is that he is not entitled to damages, for the reason, as I submit to you, that people of ordinary intelligence who knew him never could have thought that this story referred to him.

The Finale.

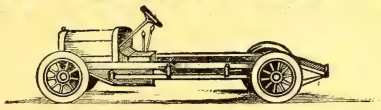
His Lordship, in summing up, said that the defendants stated that the story did not refer to any particular individual, but if they published a defamatory statement, which people who knew a certain person thought was applicable to him, they were, in law, guilty of libelling that person.

The jury found for the plaintiff for £200 damages, and judgment for that sum and costs was entered accordingly.

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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

Mr. Bonar Law's Flight to France.

On April 7th, Mr. Bonar Law flew to Paris on a Handley Page biplane, type O/400 (Rolls-Royce engines).

The Federation Aeronautique Internationale.

According to the correspondent of the "Daily Telegraph" the first meeting of the Fédération Aéronautique Internationale since the war will be held shortly, probably at Amsterdam, although Madrid has also been mentioned in this connection. Germany, and possibly Austria, will be represented. The principal subject for discussion will be the position, as regards aeronautics, of the Central Powers. Government restrictions on flying, tests for pilots' certificates, and aviation sporting events will also be discussed.

The last meeting of the F.A.I. was held on May 5th, 1914, in Paris, and the subject under discussion was the limiting of restricted areas.

An Aero Union for the Transvaal.

A meeting, at which the Mayor of Johannesburg presided, on March 28th, decided to form an Aero Union of the Transvaal, the objects of which are "The education of the people in the development and possibilities of aeronautics; to encourage the establishment of aerial services of all kinds; to foster under its auspices the formation of aero clubs in different centres; to associate itself with similar institutions throughout the country, and generally to promote the interests of aviation in this country."

Lord Buxton was elected honorary president. An administrator, a vice-president, and a representative committtee were appointed. Mr. Sturrock, President of the Chamber of Commerce, was elected chairman.

The Scandinavian Flying Exhibition.

At the forthcoming flying exhibition which is to be held in the Tivoli at Copenhagen, this month, one of the attractions will be a competition called "Star-flying," in which the entrants will be required to fly from a central point to various outlying points. Reuter states that Swedish, Norwegian, and Danish aviators, both military and civil, have entered for this event.

Apparently "Star-flying" is not to be confused with stunt flying, as the entrants are to travel merely from point to point.

Landing in Streets.

According to a United States Wireless message, the Aero Club of America has announced that Captain D'Annunzio, son of the Italian poet-aviator, is manufacturing aeroplanes with a wing spread of less than 20 ft., capable of landing in streets. They are to sell at £240 each

The new machines, which Captain D'Annunzio has designed, are guaranteed to fly 2½ hours at 50 miles an hour, carrying a man weighing a maximum of 165 lbs. It is announced that members of the Aero Club have ordered several of these new machines.

It is presumed that the ability to land in streets is the chief attraction to the members of the Aero Club of America, but one expects trouble if they use those fly-abouts for shopping excursions in New York. It might surprise the American journalist who wrote the paragraph to know that machines with a span of less than 20 feet have been flown successfully, but the builders did not advertise them as suitable for landing on what our cousins call the "sidewalk."

Propellers Covered with Aluminium.

According to the "Scientific American," a waterproof coating for aeroplane propellers, which incorporates thin aluminium leaf in the finish, was developed by the Forests Products Laboratory at Madison, Wis., and placed in production by the War Department. The process is practically 100 per cent. effective in preventing absorption of water, particularly in the storage stage. A French authority states that 80 per cent. of the French propellers produced are rejected by the pilots mainly because they are out of balance. This difficulty is due largely to unequal absorption or distribution of moisture, and can be greatly reduced by an effective waterproofing.

One has doubts about the statement that 80 per cent. of propellers are rejected. It suggests that some people must have been abnormally fond of streamline walking-sticks or that the anonymous "French authority's" mentality suffers from the same defect as the condemned propellers. For the credit of French manufacturers one prefers the latter explanation.

Bombarding Non-Combatants with Gold.

It is reported by U.S. Wireless that a Curtiss aeroplane carrying Miss Molly Pearson, an English actress in "Pennywise," now playing in New York, flew over the city distributing 10,000 two-cent pieces and nine gold pieces.

One wonders what would be the effect of a gold piece dropped from a height of, say, 10,000 feet upon the face of a non-combatant who might happen to be looking up at the aeroplane. As the coin would arrive at a speed approaching that of the muzzle velocity of a rifle bullet, it appears doubtful if the consignee would be grateful. The aeroplane has been put to some strange uses, but this bombardment of (it is hoped) innocent citizens appears to be the most insane performance yet accomplished.

Caribou Hunting by Aeroplane.

The following letter appeared in the "Times," of April 2nd:—

"Sir,—I have been hoping to see a pronouncement by some well-known or recognised sportsmen banning the hunting of game by aeroplane. To my mind, the use of an aeroplane in the pursuit of game is many degrees worse than the 'crime' of shooting a fox would be to a follower of the Quorn or Cotswold. The suggested wholesale slaughter of caribou by means of aeroplanes must make all true sportsmen shudder, and if this example were followed it would aid in the decreasing herds of antelopes, giraffes, buffaloes, etc., not to mention elephants in Central Africa, being speedily exterminated.

"The prospect fills one with horror, and not a moment ought to be lost in formulating the use of aeroplanes in sport. Otherwise our beautiful world may present the disgusting spectacle of being only inhabited by degraded humanity.—J. Lister Wright, Capt., R.A.M.C. (T.)."

The correspondent omits to mention the reprehensible sport of herring-hunting with H.E. dropped from seaplanes, but, nevertheless, he makes out a strong case. It would indeed be lamentable if all the cultured buffaloes and elephants were exterminated and only degraded humanity left.

But, seriously, is it to be believed that there is danger of game-hunting by aeroplane becoming popular? One has a higher opinion of Britishers, at any rate.

One certainly remembers the story of the Cockney who was told not to shoot at a running bird, and his reply: "I'm not going to, I'm waiting for it to stop." This person's idea of sport was crude, but barbarians of his type are not likely to fly over Central Africa in search of elephants or buffaloes.

The Bolo Riddle.

Recently, as recorded in these pages, the "Daily Mail" arranged to have a special edition carried from London to Bournemouth in an aeroplane. It was a Service machine that conveyed the papers, and a few days later Lieut.-Col. Malone asked in Parliament whether this was in accordance with the regulations.

Major-General Seely replied that it was not, and stated that the firm in question had been informed that the Air Ministry could not permit such action pending the re-opening of civil aviation.

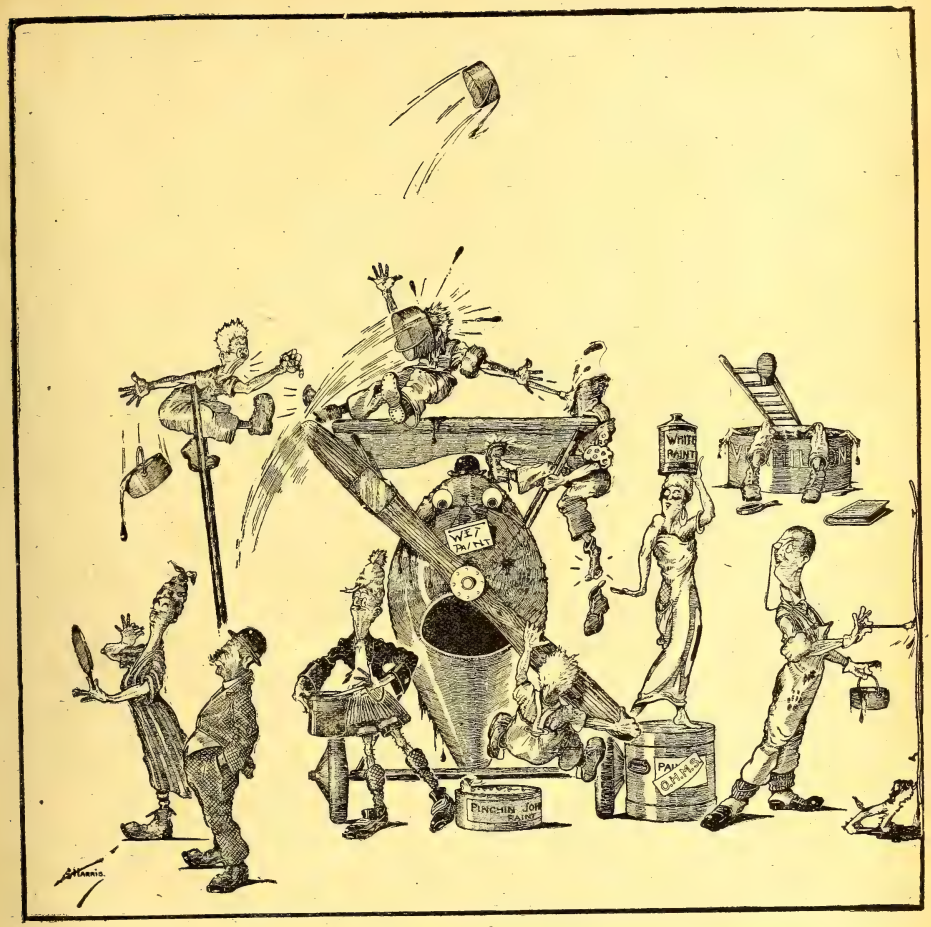
It appeared, therefore, that commendable enterprise had been crushed to the satisfaction of the House, and that everything possible was being done to delay the development of vulgar commercialism.

But now, with inconsistency characteristic of the Bolo, a Bristol Fighter machine is being lent to a cinematograph company till the end of May for the purpose of distributing films which show H.R.H. the Prince of Wales taking a part in a picture drama.

Truly, those are things no fellow can understand! Why should newspaper distribution by aeroplane (an extremely effective method of proving to business men the commercial possibilities of aerial transport) be discouraged, and the carriage of cinematograph films (that appeal chiefly to juvenile minds enthroned in persons of various ages) be given official sanction?

In trying to discover the essentially Bolological methods of reasoning by which such decisions are obtained one is reminded of the child who asked the riddle: 'What animal is it that has fur, four legs, and that quacks like a duck?" As no one could guess, the youthful interrogator gleefully said the answer was "a dog," and, when it was objected that a dog rarely quacked, remarked, with maddening placidity, that the quack had been put in to make the riddle more difficult.

Apparently, the Air Ministry has "put in" this aeronautical cinematograph stunt to make it more difficult for anyone to guess what are the intentions regarding the immediate future of commercial aviation.



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The WORLD of AERONAUTICS (continued)

An American Service Aviation Trophy.

The New York "World" has offered a trophy to be competed for annually by military, naval and marine aviators. The first contest will be held at Atlantic City in May, and the trophy will be awarded to the aviator who makes the longest non-stop flight over land or water from Atlantic City to any other point.

Perhaps later we shall be enlightened as to the meaning of "marine aviators."

The London Flying Club.

The building for the London Flying Club at Hendon is now nearly completed. It is a large red brick structure near the entrance to the aerodrome. On the ground floor there are a dining-room, anteroom, and lounge, a ladies' boudoir, and an American bar. There is also a hall 130 ft. by 80 ft., with a large stage. On the first floor, in addition to 80 bedrooms and bath rooms, with showers, there are to be a library, with books of reference on flying matters, and a card-room.

The main object of the enterprise is to provide all the attractions of a first-class club with facilities for flying. In the hall there will not only be dancing and theatricals, but lectures and cinematograph exhibitions dealing with air matters.

Members will also be able to hire machines, and arrangements are being made for the exchange of facilities with the Sussex County Air Club at Shoreham, so that members will be able to fly down to Shoreham, spend a day by the sea, dine at the local club, and fly back to town.

For the first 500 members the rate will be ten guineas a year for men and seven for women, with no entrance fee.

Italian Aviator's Death in the Alps.

The inquiry held into the death of the Italian aviation officer Palli, who was carrying to Paris a message from D'Annunzio to the French people, has thrown some light on the tragic adventure. It appears that Palli had crossed the Alps near the Little St. Bernard, when a storm arose which caused his machine to crash in the district of Sainte Foy, at the foot of Mount Pourri, at a height of 3,237 metres, where the ground is covered with perpetual snow. Marks found in the snow extending over a distance of 1,500 metres show that Palli was still alive after the crash. His injuries appear to have been slight, and it was in the storm which raged at the time of the accident that he met his death. The machine has not been found.

A French Aerial "Ambulance."

A Red Cross aeroplane named the "Aerochir" was tested recently at Issy-les-Moulineaux. It is a "pusher" Voisin machine, and the ambulance part was designed by MM. Nemirowsky and Tilmant. All the surgical apparatus for operations and dressings, as well as an X-ray outfit, and the personnel required, including pilot, surgeon, and radiographer, are carried. The total weight of the machine does not exceed 1,540 lbs.

An American Aircraft Deal.

According to the New York "World," 25 American aeroplanes have been sold to the Czecho-Slovak Army.

The Royal Aero Club Subscription.

In accordance with the resolution passed unanimously at the annual general meeting of the Royal Aero Club on March 31st, 1919, the subscription for members elected on or after May 31st, 1919, shall be £7 7s. per annum and the entrance fee £5 5s.

The R.A.F. in Russia.

Concerning the recent withdrawal of the Allied troops from the region Shenkursk, it is announced officially that during the operations, although the temperature made aerial reconnaissance extremely difficult, valuable assistance was given throughout by the R.A.F.

To 55 Squadron, R.F.C.

It is announced that a history of the work of No. 55 Squadron, R.F.C., is in preparation. All officers of the squadron, both as an R.F.C. and as an R.A.F. squadron, are invited to communicate with Captain L. Miller, R.A.F., Headquarters, R.A.F., B.E.F., so that they may assist in the compilation of the history of the squadron.

The 84th Squadron Dinner

The final dinner of the 84th Squadron will be held at the Criterion on Saturday, April 12th. All desirous of attending, should communicate with Lieut.-Colonel W. S. Douglas, M.C., D.F.C., R.A.F., Cranwell, Lincs, or Captain G. Aste, R.A.F., 13, Bruton Street, W.

The All-Steel Aeroplane.

The lecture on the "All-Steel Aeroplane," which Dr. A. P. Thurston was to have given before the Royal Aeronautical Society, has unfortunately been postponed, as, following an attack of influenza, Dr. Thurston has been suffering seriously from pneumonia. It is pleasing to know that the lecture will be given as soon as the state of his health permits.

In the meantime a member of the C.A.T. Committee has been inspired by Dr. Thurston's remarks to indite the following:—

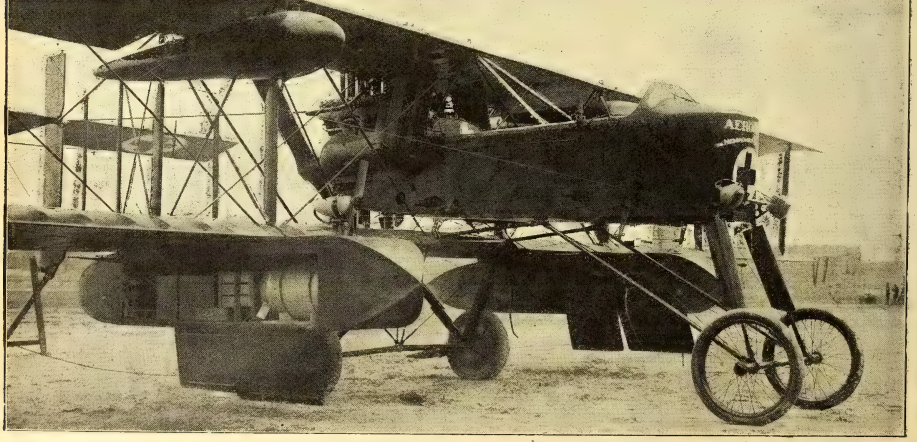
SONNET.

By a Member of the C.A.T. Committee.
Dedicated to the Timber Committee: Being an Argument in favour of the All-Steel Aeroplane.

Oh we who do with cunning infinite
And nightly lamps, burnt to the ambient air,
Devise vast schemes of traffic and of flight
And routes and marts for argosies prepare,

Dream we of cargoes borne upon the wind
And spirit-burning engines whirring loud
Whereby the fruits of Afric and of Ind
Shall fall dew-laden from each wandering cloud.

Enough! Each tree that blooms within the scene,
Each Dryad fluttering in her robes of green,
Resents our conquest of her ancient ease,
Shall she, bird-haunted, yield her feathered brood
And bear instead of songsters, birds of wood?
If they are wood, What, then, the heads of these!



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PARIS NOTES

Many years ago, in 1911, I believe, the "Journal" organised a most successful circuit, aiding at the time an industry as impoverished as our own, and drawing the attention of all Europe to the potentialities of the newest means of locomotion and the fifth arm.

It was subsequent to this that official Germany took an ever increasing interest in the military side of aviation. This week, however, the "Echo de Paris" has taken a leaf out of their book and announced the preliminary details of a competition to be organised to assist the progress of commercial and touring aviation. £12,000 is to be divided between the successful competitors. The competition will be divided into two distinct parts :—

1. An eliminating contest, consisting of a circuitous journey of about 4,000 kilometres, in twenty stages, passing the largest French towns en route, and touching all adjacent foreign countries with the exception of Germany.

2. A detailed examination of the performances and characteristics of machines having fulfilled all the conditions of the first contest, and to be judged with special regard to security, comfort, commercial speed (average taken over the whole course between departure and arrival), maximum speed, load carried, and cost per kilometric ton.

The contest is open to :—

(a) All machines carrying four or more passengers ;
(b) The aviation industries of France and her Allies ;
(c) Single, twin, or multi-engined machines.

A Criticism of the French Aviation Vote.

On Saturday, March 29th, the Chamber of Deputies had an all-night sitting. The séance did not terminate till 3.35 a.m. owing to the discussion of the Aviation vote, the budget for which is about £40,160,000.

M. P. E. Flandrin drew attention to the fact that the reserve stocks of spares were not up to establishment, citing the case that only 800 cellules were in stock at that date, whereas there should be 4,000. He was also persistent in his demands to know what had become of the large number of German machines which were to have been surrendered in accordance with the conditions of the Armistice, pointing out at the same time that only 600 avions had taken part in the provisioning service for the liberated regions, and transporting an average of 137 kilos per voyage. For these reasons M. P. E. Flandrin asked for a reduction of £360,000 on the estimates.

Replying for the Administration, Col. Dhé, Director of Aeronautics at the War Ministry, said that French Aviation was passing through a very difficult period in passing from a war industry to a peace industry. It was above all necessary that civilian aviation should benefit in every way possible by the resources of the military side.

Replying to the alleged non-utilisation of the Boche machines, Col. Dhé explained that the requirements of civil aviation were not those of the military side, consequently some time had to elapse in order to allow the necessary modifications to be made.

In support of the authorities' policy in asking the Chamber for such a large amount, Col. Dhé pointed out that the cost of such services per kilometric ton was ten francs. It was therefore imperative that the Aeronautical Industry receive State subsidisation.

Finally, agreement was reached between the Budget Commission and the Government. A reduction of £420,000 was made.

Reduction of nearly £700,000.

The Senate approving the conduct of the Lower House further reduced the amount by £210,000, making a total reduction of nearly £700,000. Nothing daunted, however, the War Minister formulated a request for a supplementary credit of £173,000 to defray the expenses of different aeronautical missions in foreign countries, the objects of such missions are :—

1. To sell under favourable conditions the surplus stocks of raw and finished aeronautical products.
2. To create new trade outlets for the aeronautical industry.
3. To prepare the establishment of international aerial lines.

Scathing Comments.

M. P. E. Flandrin passed many scathing comments on the administration of Military Aviation. He strongly opposed the continuance of the policy which allowed the Civil Aviation Administration to be attached to the Military, and pointed out that the British and the Italian possessed a greater technical efficiency, inasmuch as they both had given much study to the type of machine that had a large carrying capacity. He said that it had been a struggle to induce the Aviation H.Q. people to approve the construction of the giant machines.

In his opinion, Commercial Aviation would not be self-supporting for at least ten years, therefore it was necessary to cut down ruthlessly all superfluous expenditure and organisation on the military side.

M. Flandrin emphasised the point that orders for military machines must stop some day, and asked why they should not cease now, as five-sixths of the machines ordered were single-seater scouts or two-seater reconnaissance machines—useless in competition with foreign (presumably British) civil and commercial aeroplanes.

The Military Authorities Supported.

Colonel Dhé made a most excellent reply to M. Flandrin's charges against the policy of attaching the Civil Aviation Administration to that existing for the Army. He pointed out that the Military Authorities alone could provide the technical resources necessary to the early development of Commercial Aviation, such as the technical personnel, aerodromes, training schools, hangars, wireless stations, meteorological observatory, and so forth.

Erstwhile Heroes.

Eight or nine years ago the man who flew an aeroplane, in however suicidal a manner, was a hero. If he descended in the main street of the capital he was received by the President. The man who does the same thing to-day should be regarded as a criminal.

During the past week an aviator flying a Nieuport single-seater has been employed in throwing overboard announcements of a new revue to be produced shortly. The pilot gave a wonderful exhibition of clever flying, reminding one of a dragon-fly or a big bumble-bee, as he buzzed backwards and forwards, ten feet or so from the chimney-tops. One hopes that such exhibitions will in future be forbidden.

The Goliath's Weekly Trip to Brussels.

The Goliath made its weekly trip to Brussels and back without any untoward incident. The passengers meet at 10, Rue Auber, Paris, and are taken by car to Toussus-le-Noble, which is the Parisian terminus.

A New Height Record.

On April 1st the Goliath made an attack on the height record with five passengers. The pilot, Bossoutrot, took up with him the following mechanics :—Mathé, Feron, and Mulot, and a brother aviator named Muller. The machine rose to 6,200 metres (about 20,150 feet) in an hour and a quarter, and undoubtedly would have gone much higher had not the controls frozen. The lowest temperature recorded was 40 deg. Cent. (72 deg. Fahr. of frost). The record was officially registered by M. Dollfus, of the Aero Club.

The previous record for five persons was set up by Poirée in 1916.

A King's Flight to Paris.

For the first time in history a King has arrived in Paris by air. One is aware that it is not by any means the first time the King of the Belgians has flown, yet one may still be pardoned a little quiet reflection on the effects this break with precedent will have in the future.

At the moment, anyhow, a King cannot fly en suite, neither can he take much with him in the way of personal baggage. The flight took place on April 1st, and the pilot was Crombez, a well-known Deperdussin pilot in pre-war days.

A Giant Hydravion.

Further details are now available anent the "Orion," a new giant hydravion constructed at Lorient. The dimensions are : Span, 32 metres ; length, 16 m. 50 ; height, 6 m. 50 ; chord, 3 m. 80 ; gap, 3 m. 60 ; weight, 4,150 kilos ; surface, 212 m. 2. Three 400-h.p. Lorraine-Dietrich engines are fitted, actuating three air-screws, one tractor and two pushers. Two large fuel tanks are fitted, each containing 1,000 litres of petrol. Each engine is provided with an automatic starter worked by compressed air. The pilot will be Master-pilot Jean Le Borque.

The Wings of Peace.

M. Clemenceau has paid a curious compliment to the work of the French Flying Corps in allowing both officers and men, who have belonged to the "Navigating personnel" of a squadron at the Front, to wear the French equivalent of our "wings" on their return to civil life.

More Aerial Posts.

April 1st saw the inauguration of an aerial post serving Nancy-Briey-Longwy. The journey took three hours ; four mail-bags were carried. It is said that passengers will be taken on this route shortly.

There is also to be a lateral postal service across France soon, from Nancy to Bordeaux *via* Dijon and Chateauroux, thus obviating the useless transference of mails at Paris. The approximate distance, return, is 1,500 kilometres.

F. T. N.

THE TRANS-ATLANTIC COMPETITION.

The following is the text of a statement issued by the Air Ministry :—

Within the next few weeks, perhaps within the next few days, an effort will be made to cross the Atlantic by aircraft. The accomplishment of this feat will mark a new and historic advance in the development of aviation. Longer flights have already taken place by lighter-than-air-craft, but these were mainly over land routes. The attempt to fly the Atlantic, involving an oversea passage of over 1,900 statute miles, is a much more serious and difficult feat than is a similar trip over an all-land route.

The Air Ministry, recognising the difficulties to be overcome, and the importance of securing successful flights by British machines, have placed their information, knowledge, and resources at the disposal of the aircraft firms, and the pilots who have decided to attempt the flight for the "Daily Mail" £10,000 prize.

List of Entries.

The list of entries for the flight as given by the Royal Aero Club is as follows :—

Machines.	H.P.	Speed.	Pilot.
Martinsyde	285	100	Mr. F. Raynham.
Fairey	375	120	Mr. S. Pickles.
Short	350	95	Major J. C. P. Wood.
Sopwith	350	100	Mr. H. G. Hawker.
Whitehead	1,600	115	Captain A. Payzo.
*Seaplane	440	—	Captain H. Sundstedt.

* This machine is reported to have been damaged, but the entry has not been withdrawn.

The first five machines are of British design and manufacture. Most of them are types which have rendered good service during the war, and it would be but fitting that one or all of them should accomplish this new record in a more peaceful field. These machines will not start together, and it lies with each pilot to set out on his venturesome journey on his responsibility as soon as his own plans are completed.

The arrangements for carrying out the flight are necessarily prolonged and arduous. Some firms desiring to compete were without machines owing to their whole output being under contract to the Government, and the Air Ministry has released machines where necessary. Other firms were without the necessary engines, instruments, wireless telegraph apparatus, etc., and the same facilities have been afforded to secure these.

Owing to meteorological consideration it has been generally decided to start from the American side of the Atlantic, and the Ministry has endeavoured to secure shipping priority both for machines and pilots in order to facilitate the arrangements for making a start at the earliest possible moment.

An aerodrome has been under construction by the Air Ministry in Newfoundland, and has been cleared sufficiently for the use of machines as a starting base. The competing firms, however, must make their own arrangements for sheds and accommodation for *personnel*.

An R.A.F. officer has been placed at the disposal of the Royal Aero Club to act as official starter, and he will also be responsible for placing identification marks on the machines.

The moon will be full on April 15, and it is probable that the first attempt will be made by Mr. H. G. Hawker, flying the Sopwith machine, on or about this date. He is expected to start about 2 a.m. Newfoundland time (about 10 p.m. British time). He would thus fly through the night, and if his venture succeeds should arrive between 4 and 5 o'clock the following afternoon. (The approximate starting dates of the other competitors is not yet known.)

The Navigator's Work.

The navigator's duties in a flight of this length are extremely important, and much will depend on his calculations.

It may, therefore, be of interest to detail some of the apparatus which the navigator will use for attaining the successful accomplishment of the flight. A good compass is essential, and also

a drift bearing plate,
a course and distance calculator,
a chronometer watch,
a sextant,
a navigating machine, and
a protractor.

With these instruments at his disposal and with the meteorological information and directional wireless available to him the navigator should be able to keep a correct course for the British Isles.

Three methods of navigation can be used :—

Direction finding by wireless telegraphy.
Astronomical observations.
Dead reckoning.

The first method consists of flying on a bearing of a known wireless station, the wireless apparatus where carried being designed to enable bearings to be taken on the Marconi Trans-Atlantic station at Clifden in Ireland, or Glace Bay in Nova Scotia. The bearing will not give the pilot his distance from the station, and is, therefore, only useful for showing whether he is keeping his approximate course. As this method of navigation is inadequate owing to the lack of wireless stations to the north and south of the course across the Atlantic the second method may have to be used in conjunction with it. An observation by sextant of sun or stars taken from time to time renders it possible for the navigator to fix his position within about 20 miles. Again, there may be a space towards the centre of the flight in which the machine will be out of wireless range from either side, and here observations by sextant may have to be depended upon. The third method—dead reckoning—is used in conjunction with direction finding by wireless and astronomical observations. It consists of calculating the position of the machine from time to time according to its airspeed, and the estimated force and direction of the wind.

On this flight further assistance may be obtained by the navigator by means of wireless communication with passing ships which may be able to give him their position. With this end in view ships have been asked to assist in every possible way, and the Marconi Company are also instructing their ship operators to render every assistance. Ships which hear aircraft during the night have been asked to fire lights to attract the airmen's attention. Should a vessel, however, sight an aeroplane and receive no wireless signals she will send her position by wireless three or four times in case the aeroplane's transmitter may have broken down.

An aeroplane in distress will fire a series of white Vérey lights at short intervals or will send an S.O.S. call. Ships have been warned that if such signals are observed or received or if an aircraft is seen to be in difficulties every endeavour should be made to go to the rescue.

During April the prevailing winds over the greater part of the Northern Atlantic are westerly, and have a surface velocity of 15 to 20 miles an hour. On the north of the direct lines between Ireland and Florida from 10 to 20 per cent. of the prevailing winds are of gale force. South-east of Newfoundland is a region where fog is prevalent on 40 per cent. to 45 per cent. of this month; east of this region there is a gradual decrease of fog, until in mid-ocean south of latitude 40 deg. north it is rare.

During this flight, therefore, the winds may be of great assistance if the start is carefully timed. To assist in this, and in order that the fullest possible information may be available, arrangements are being made for frequent weather reports to be furnished by day and by night to the competitors both before starting and also during the flight. These reports are being obtained by the Air Ministry from the U.S. Weather Bureau, the Canadian Meteorological Office, Newfoundland, home stations, and ships along the route, and efforts are also being made to secure regular weather information from the meteorological stations at the Azores and Lisbon. The Air Ministry Meteorological Staff will forward special reports, based on the information obtained from these sources to the R.A.F. Meteorological Officer at Newfoundland and the U.S. Weather Bureau, which will keep in close touch with the competitors before the start, and will forward all weather information to them as soon as it is received.

Competitors starting from this side will receive weather forecasts direct from the Air Ministry.

As the competitors' machines are fitted with wireless apparatus for short-wave messages only it is impossible to communicate forecasts or warnings direct from land stations during the flight, and the method of transmission must therefore be *via* ships along the route. The necessary arrangements have been completed for forwarding this information *via* land stations to shipping, which will communicate it to the competitors. These vessels will also report surface weather conditions in their own neighbourhood when they are able to get into touch with passing aircraft.

The Marconi Company is helping in collecting and transmitting this information from land stations and ships free of charge during the competition.

For the convenience of competitors who may desire to land in Ireland, the Air Ministry has arranged for an R.A.F. aerodrome at Fermoy, County Galway.

ADMIRALTY NOTICE.

The following is the text of the notice issued by the Admiralty to mariners :—

North Atlantic route.

Instructions to vessels with regard to aircraft.

The following instructions, which are promulgated with a view to assisting aircraft attempting trans-Atlantic flights when out of sight of land, should be observed by all vessels employed on the North Atlantic route until further notice :—

(1) Should a vessel receive a request from aircraft for her position the reply should be sent at a Morse speed of not greater than 12 words per minute.

(2) Should a vessel sight an aircraft and no wireless signals be received from it, the vessel should transmit her position by wireless three or four times, without waiting to be requested to do so, as the aircraft wireless transmitter may have broken down. The position is to be transmitted in words and not in figures, thus—latitude fifty thirty, longitude thirty twenty.

(3) British commercial aircraft on trans-Atlantic flights will, for the present, use call signs of three letters (D K A to D M Z). The usual international procedure should be employed for inter-communications.
(4) Should an "S.O.S." call from aircraft be received, or aircraft be seen in difficulties, every endeavour possible should be made to rescue the occupants.
(5) Great assistance will be given to aircraft in sighting ships at night if ships on hearing aircraft overhead will fire any form of pyrotechnic lights to attract attention. This will, if possible, be replied to by the aircraft firing one coloured Verey light or on her wireless.
(6) An aircraft in distress will fire a series of white Verey lights at short intervals. Any ship in the vicinity should then indicate her presence and endeavour to rescue the occupants.

NOTE.—Aircraft attempting Trans-Atlantic flight will be equipped with wireless telegraph apparatus capable of transmitting and receiving on a 600 metre wave (spark).

THE PROGRESS OF COMPETITORS.

So far as the British entries are concerned, the preparations for making an early attempt on a trans-Atlantic flight are nearing completion. The U.S. Navy and Army are both entering a machine, but there is no definite information about them.

The Sopwith machine has arrived at St. John's, Newfoundland, whence a start will be made, and the assembling was begun on Friday, April 4th. It is, however, unlikely that the flight will be attempted during the next fortnight, as the starting ground is very wet and will require many days to dry.

In order to make a start as quickly as possible, Major J. C. P. Wood, R.A.F., the pilot of the Short machine, intends to attempt a flight from this side of the Atlantic. Stores of petrol are being collected at Limerick.

It is stated by officials of the U.S. Navy Department that British destroyers are to co-operate with American Naval vessels in patrolling the course which is to be followed.

According to the present arrangements, there will be from 50 to 60 American destroyers patrolling the course from Newfoundland to the Azores, the stations being at less than 200 miles' distance from each other, and from 40 to 50 British destroyers will be on duty between the Azores and the British Isles. Along the greater part of the course there will also be a large number of Army transports going to and returning from France.

Besides these destroyers, it has been decided to have a fuel ship, probably the "Melville," stationed on the route.

At the moment of going to press it is announced that a Handley Page machine with four Rolls-Royce Eagle engines of 350 h.p. has been entered for the Atlantic Flight.

The Trial of an American Aviator.

On April 2nd, Captain E. G. Chamberlain, U.S. Marine Corps, was brought before a Court Martial sitting at the American Naval Headquarters, 30, Grosvenor Gardens. He was charged with "Scandalous conduct tending to the destruction of good morals," in that after an unofficial attachment to a Royal Air Force Squadron on the Western Front in July last he prepared a series of reports dealing with his exploits in which truth was not a notable factor.

Capt. Chamberlain is as well born as is possible in the United States, and has parents in Texas. His record in the American Service is good, and in the inter-tribal squabble with Mexico he showed prowess and initiative.

The reports in which action is being taken purported to be signed by Capt. C. M. Lowe, R.A.F., and Major D. M. Vaucour, M.C., R.A.F., the former of whom says he signed no report. The latter died last summer, a fortnight before the date of the report which he is said to have signed.

Capt. Chamberlain was unable to describe the appearance of the British squadron commander with whom he alleged he flew, and he knew nothing of the topography of the country and other points which he should know if his report were true.

It was stated that General Salmond had caused an inquiry to be made as to the alleged exploits, but nothing had been discovered in support of Capt. Chamberlain's claims.

The case is still proceeding.

The reports in question were forwarded through his Commanding Officer to American Headquarters, and in view of their contents and of the misguided enthusiasm of the daily newssheets it was desired to decorate him in a manner suitable to the work he claimed to have done.

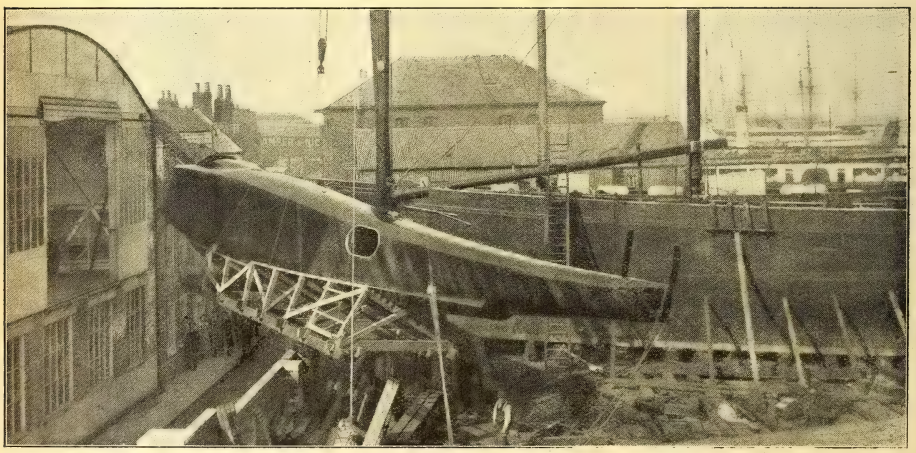
The reports stated that he had eliminated a train by means of a well-dropped bomb, had joined in a "dog-fight," in which the Germans had 12 aeroplanes and the Allies three, seven enemy machines crashing to earth during the mêlée, and had landed on the field of battle under heavy fire and captured a German by pretending that his compass was a bomb. The story in this part of the report reads as follows:—

The enemy could not see anything but the top wings of my machine, but they began to shell it, so I tore out the round iron compass and maps, and tried to burn the machine with the maps. . . . On the other side there were three Huns crawling my way.

I was unarmed, but remembering my compass looked like a grenade, I hauled back as if to throw it. Two of them jumped and ran, the third yelled "Kamerad," and threw down his rifle. I got to that rifle, and then took his pistol and ordered him to crawl ahead. . . .

In the middle of the woods there was a stream. As we came to it I heard a whispered groan in French, so I crawled up a few yards, and there lay a wounded Colonial hit in the leg and neck. I gave the African a drink and washed his wounds, so he could move. Then I picked him up and ordered the German to wade across with his hands up (all this whispered).

Some German snipers took three shots at me, but they only splashed about us. I had to drag the Colonial, with the German helping, through the thicket. Then suddenly we were fired on and then a challenge in French.



THE BIGGEST FLYING-BOAT HULL.—The Photograph above shows what is at present believed to be the Biggest Flying-Boat Hull in the World. It was built by the Gosport Aircraft Company, and is shown being hauled out from their Works for Transport by Road. Very great interest attaches to the picture, in that in the right-hand top corner, there appears Admiral Lord Nelson's old Flagship, "The Victory," in her day the most famous sea-going Craft, just as it is hoped that the new Big Flying-Boat may be the most famous sea-going Craft of to-day. Further interest is given to the Photograph by the fact that, in the centre of the Picture, may be seen a part of the Works of Messrs. Camper and Nicholson, the famous yacht builders, Mr. Charles Nicholson being a founder and director of the Gosport Aircraft Company.

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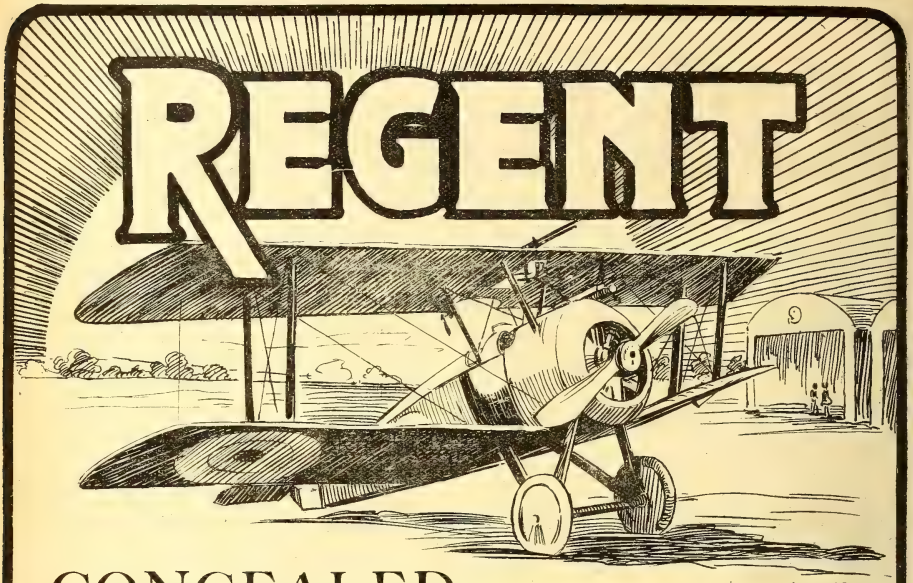


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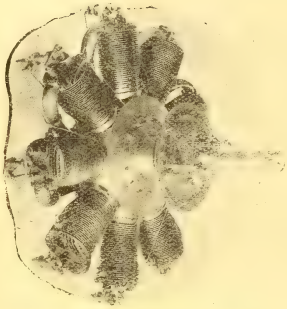
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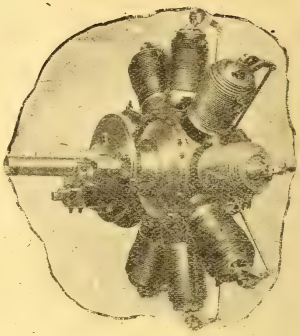
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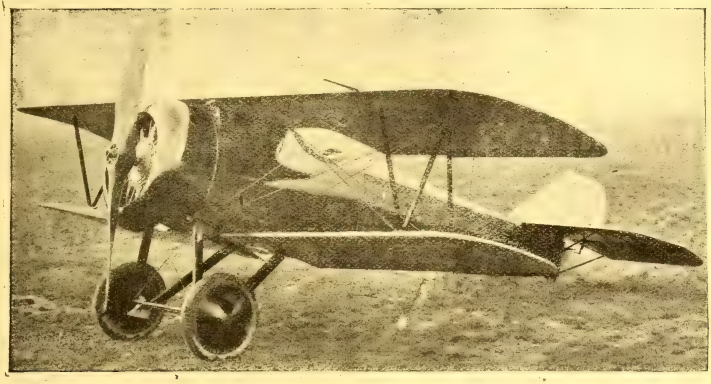
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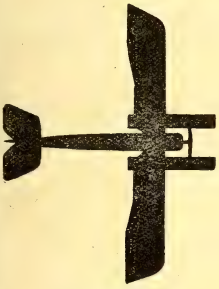
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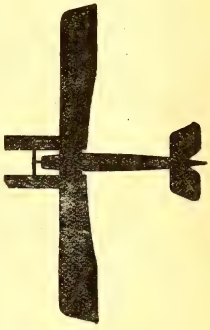
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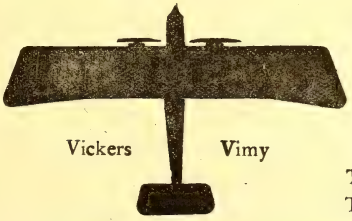
Short Seaplane
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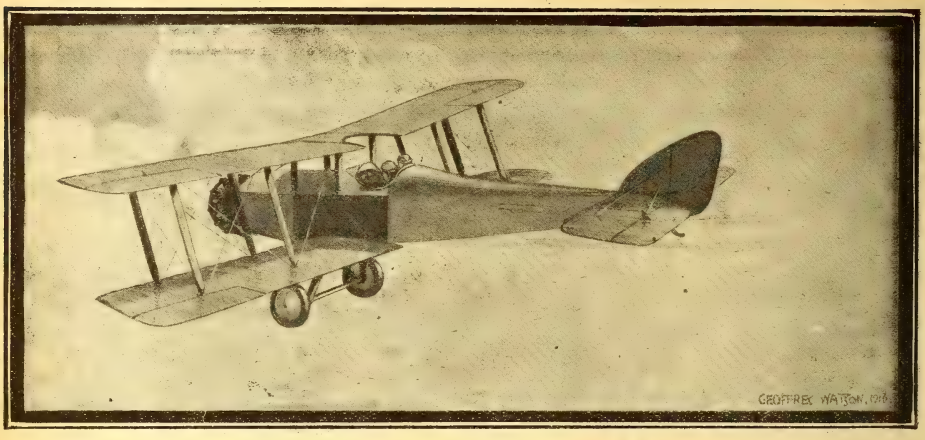


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THE WEEKLY COMMENTARY.

In the ninth instalment of the article on "Commercial Aircraft Design" the effect of different classes of loads on machine design is considered by Capt. Sayers.

His argument that mail aeroplanes are unlikely to carry passengers because the provision of accommodation for such loads will seriously interfere with their efficiency as mail carriers is worthy of attention, and seems to be reasonable.

The official description of the German Bassé-Selve engine, which is published this week, is a striking case of the Teuton method of improvement in detail while retaining the essential features of well-tried design. There can be very little doubt that by sticking very closely to a standard type of engine our enemies secured very important advantages under war conditions.

On the other hand, they are very likely to find that the small diversity of engine types which they now have available will form a serious handicap to the development of aircraft for peaceful purposes.

It has to be admitted, however, that the type upon which they have concentrated is one which, on the scores of simplicity, economy, and reliability, is of very great all-round utility.

COMMERCIAL AIRCRAFT DESIGN.—IX.
ON THE DISTRIBUTION OF LOADS.

By Capt. W. H. Sayers, late R.A.F.

It is a fairly well-known fact that in any aeroplane which may have to carry a variable load it is desirable that the changeable part of the load should be carried as nearly as possible at the centre of gravity of the whole machine, in order that the balance of the machine may be altered as little as possible by changes in that load.

It is also fairly well known that by the use of such expedients as a tail plane fitted with mechanism whereby its angle of incidence may be varied whilst in flight, it has been found possible to carry such variable loads as bombs at some considerable distance from the centre of gravity, and still keep the machine in balance under all loading conditions, in spite of the fairly large movement of the centre of gravity which occurs.

It must not be assumed that, because such changes in position of the centre of gravity can be compensated for, they are unimportant.

For any aerofoil arrangement there is some optimum position of the centre of gravity which will give a minimum value to the size of tail plane, and the length of tail lever arm, which will secure any desired degree of longitudinal stability.

This position of the centre of gravity is usually fairly far forward, at about 0.3 of the chord of the monoplane equivalent to whatever aerofoil arrangement is employed, and any departure from this position of the C.G. will call for either a larger tail plane or a longer fuselage.

In a machine with a variable position for the centre of gravity, if the tail plane area, angle of incidence, and lever arm are determined for the best position, it will not be found possible to obtain the same degree of longitudinal stability with any other position of the C.G. by merely altering the tail setting. Therefore the tail area of such a machine must be determined for the worst conditions, and it will necessarily be larger, and therefore heavier and of greater resistance, than would be needful could the C.G. remain always at the optimum position.

On general principles it would appear desirable to keep variable loads, if they cannot be placed on the C.G., ahead of it, and to arrange for the C.G. to be at its optimum position under full load conditions.

This would tend to give the machine a maximum of stability when fully loaded, and would reduce the extra size of tail plane required under less advantageous conditions to a minimum.

Where the variable load in question consists of passengers, it is often difficult to arrange for this.

Passengers unfortunately require an inordinate amount of room, as compared with both their total weight and their actual cubic capacity.

Standing, one can pack six average humans into a square yard of floor space, but it is difficult to seat two in reasonable comfort in the same area, because legs are so badly designed for packing purposes.

If, therefore, one attempts to seat passengers ahead of the C.G. in an ordinary single engine tractor, it is necessary to place the engine sufficiently far forward to give leg room to the passengers.

This in turn calls for the fixed loads—such as the pilot—being placed very far aft to balance the engine, resulting in a machine with a great longitudinal moment of inertia, which itself will call for a larger tail plane, and thus defeat the object of placing the passengers in this position.

Where the load to be carried can be packed into a small space, this difficulty vanishes. Half a ton of man—roughly 8 persons—might be seated in a compartment 8 ft. long by 3 ft. wide, and at least 4 ft. high. They will not be very comfortable if so confined for any time.

The same weight of gold could be packed into a 15-in. cube, whilst even mails, if properly packed under slight pressure into crates, will go into one quarter of the space occupied by an equal weight of passengers.

When fairly compact loads are in question it is fairly easy to place the load on or about the centre of gravity,

or to divide it into equal parts and place the halves equidistantly fore and aft of the C.G.

For this reason it may be expected that, when commercial aeroplane mail services become an accomplished fact, the machines employed for such services will not carry passengers as a side line.

A False Analogy.

It has often been argued, on the analogy of the mail steamer, that aeroplane mail and passenger services will be carried out in conjunction and by the same machines. It has been conveniently forgotten that a high-speed ocean-going mail steamer must of necessity possess a large amount of surplus space over that which can be occupied by cargo, and that passengers can be accommodated without any serious addition either of weight or of resistance.

The airship, which depends for its lift upon the displacement of air, as a ship depends for its buoyancy upon the displacement of water, is nearly parallel to the mail steamer in this respect, and with airships the two classes of traffic will almost certainly be combined, because the space required for passengers will always be small as compared to the bulk of the whole ship, and the distribution of loads presents less difficulty than in the aeroplane.

Both in the aeroplane and in the airship distribution of load about the lifting organs has the effect of reducing the stresses in the lifting structure.

Ideal Load Distribution.

In the aeroplane this advantage is only to be obtained by distributing loads along the span of the wings, and from the purely structural point of view the ideal conditions will be secured if the loads are distributed over the wing surfaces in exact accordance with the air pressure distribution when in flight.

Obviously it is impossible completely to distribute loads along the wing span in such a way. A partial distribution is possible, and is normal practice in multiple engine machines.

Generally such a distribution of load has been confined to placing the power plant, or some considerable proportion of it, on the wings—in two equal units, one on each side of the centre line.

The removal of engines, radiators, fuel and oil tanks to some position outside the central fuselage renders it easier to arrange accommodation for passengers at or about the centre of gravity, and the difficulty of putting variable passenger loads in their right place is considerably reduced by this arrangement.

At first sight there appear to be certain advantages to be gained by centralising the power plant and dividing the load and distributing it on the wing span.

Generally, in order that the centre of gravity may be suitably far forward, it is desirable that the engines should be ahead of the wing surfaces. Therefore engine nacelles on the wings usually project forward with the engines overhung from the wings. If all the power plant is carried in the fore end of a straight-through fuselage, a better structure can be obtained, and if the cargo load is carried in side nacelles on the wings these loads will be balanced about the centre of gravity, and no overhanging structure is needed at these points. The whole power plant is then concentrated in the central fuselage, and may be made accessible to a single engine-room staff.

Unfortunately, there are drawbacks to this method of distributing the loads. If the machine is flown with no load in the side nacelles, it is in no better case than is a purely centrally loaded machine, and such a machine empty may actually be more severely stressed than if it were fully loaded.

Not only is this the case, but very great care would be required in any case to ensure that the two side loads were equal, otherwise the machine would be seriously out of balance sideways.

If a fairly uniform and predetermined load can be relied upon for every journey, the advantages to be obtained by centralising the power plant and distributing the cargo load might be a sufficient excuse for this procedure, but under normal conditions it is believed that the usual method of distributing the power plant weight and concentrating the cargo load will be found preferable.

Determining Considerations.

It is extremely difficult to determine with any exactitude when and to what extent it is desirable to distribute load along the span of the wings.

Such distribution of load can always be used to effect a saving in the weight of the structure.

On the other hand, small power plant units are usually heavier, for equal power, than are large units, and one may lose more in total weight by using two small units, instead of one large one, than can be saved in structure weight by the load distribution obtained with them.

The centrally loaded machine with the whole of its cargo enclosed in a single well faired-off body should always score on head resistance over the machine with divided loads, and will be easier to control and generally more stable laterally.

The relative importance of these points will vary with the exact requirements from each machine.

When very high speeds are required the centrally loaded machine will have a greater advantage than it will for medium speeds.

The effect of distributed loads on lateral control and stability will be more important in machines of small span than in those of large span, because with a large span the rolling period will be long, and there will be more time for controls to produce their effect.

Practical Limits.

Very roughly, however, it will rarely be found worth while, unless reliability is the overwhelming requirement, and the machine is to be designed to fly with either of its power units out of action, to divide the power units unless either the total horse-power of the machine exceeds 400 h.p., or unless the span exceeds 80 ft.

At the present moment 400 h.p. is about the limit for a single power plant, because no proved motor of much larger output is known to exist.

The possible total weight for a 400-h.p. machine will vary from about 10,000 lbs. for a slow seaplane (maximum speed 70 m.p.h. about), through 5,000 lbs. for a fairly high-speed machine (120 m.p.h. with a moderate climb and ceiling), down to 3,000 lbs. for a high-performance machine up to modern war requirements.

The 10,000-lb. seaplane could be made with a loading of roughly 8 lbs. per sq. ft., on which a low landing speed and a fairly quick "get-off" and a reasonable initial climb could be attained, using a "high lift" wing. This would call for a biplane of roughly 75 ft. span by 9 ft. chord, and the heaviest practicable machine on this power would be just on the border line at which the twin-engine arrangement probably is justifiable.

Using the usual type of high-speed wing, with so high a weight to horse-power ratio, it would be difficult to design a machine with a much higher surface loading than 5 lbs. per sq. ft. This calls for 2,000 sq. ft. of aerofoil surface and a span of 95 ft. with 11 ft. chord, and for such a machine the twin-engined arrangement probably would be justified.

(To be continued.)

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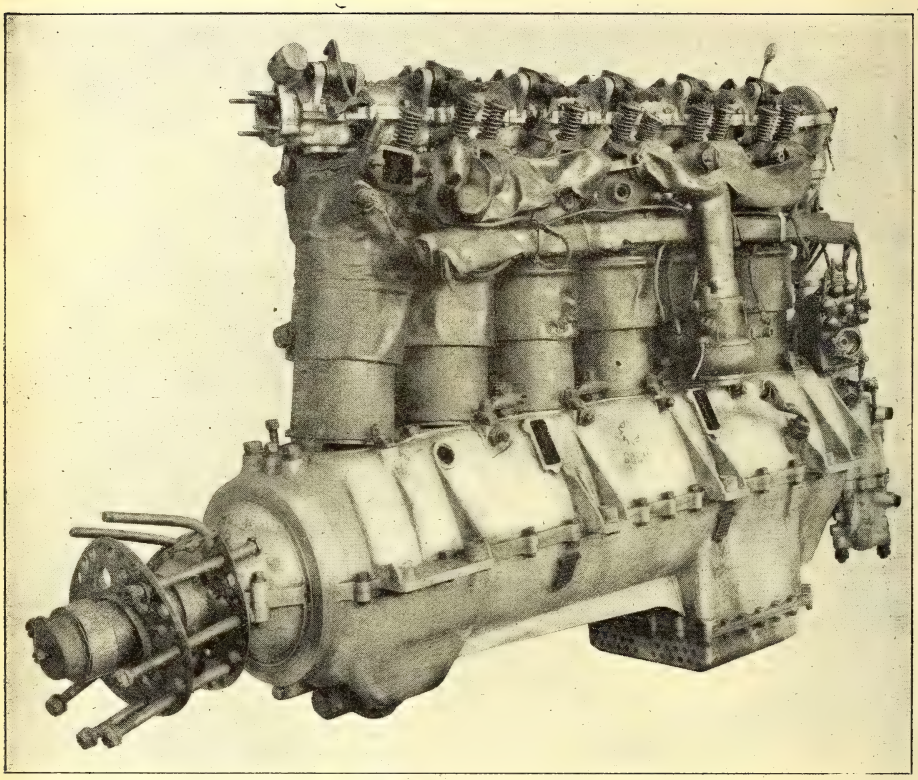
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THE 270-300 BASSÉ-SELVE AERO ENGINE



The Bassé-Selve Aero-Engine. Three-quarter View from Airscrew End.

(This Report is published by courtesy of the Controller, the Technical Department, the Dept. of Aircraft Production.)

INTRODUCTORY NOTE.

The following report on the design of the 270 h.p. Bassé-Selve engine is based on a detailed examination of the engine (No. 550) taken from the remains of a German Rumpler two-seater biplane (R.A.F. identification No. G/5BD/14), which was shot down and destroyed in France on May 31st, 1918.

Unfortunately, this is the only engine of its type which has been captured up to the time of writing, and as it was seriously damaged, it was impossible to carry out any power and consumption tests of the engine: consequently, the following report deals with design and construction only. Certain figures connected with the performance have, however, been calculated by assuming the engine speed and Brake Mean Effective Pressure to correspond approximately with those of other German engines of about the same capacity. The figures adopted for these items are as follows:—

Normal engine speed ..... 1,400 r.p.m.
Normal B.M.E.P. at 1,400 r.p.m..... 110 lbs. per sq. in.

All the figures in the data at the end of this report, which are based on the above assumption (and therefore only to be accepted with reserve) are marked with an asterisk. Actual figures and test reports on the running of these engines will be issued as soon as an engine of this type is obtained in good condition.

GENERAL DESCRIPTION.

These engines, manufactured by Bassé and Selve, Altena, Westphalia, have but recently appeared in the field. In most of their leading details of construction they closely resemble both the 260-h.p. Mercédès and 230-h.p. Benz engines, on which the design is evidently based. Markings on the engine indicate the year of manufacture to be 1917, the crankshaft being marked "A.G. Krupp, Essen, 1917." The nominal rating of the engine according to a cast plate on the crankcase is 270-h.p., and the normal engine speed would probably be about 1,400 r.p.m. Assuming the B.M.E.P. to be 110 lbs. per sq. in. at 1,400 r.p.m., the power developed would be approximately 269 b.h.p.

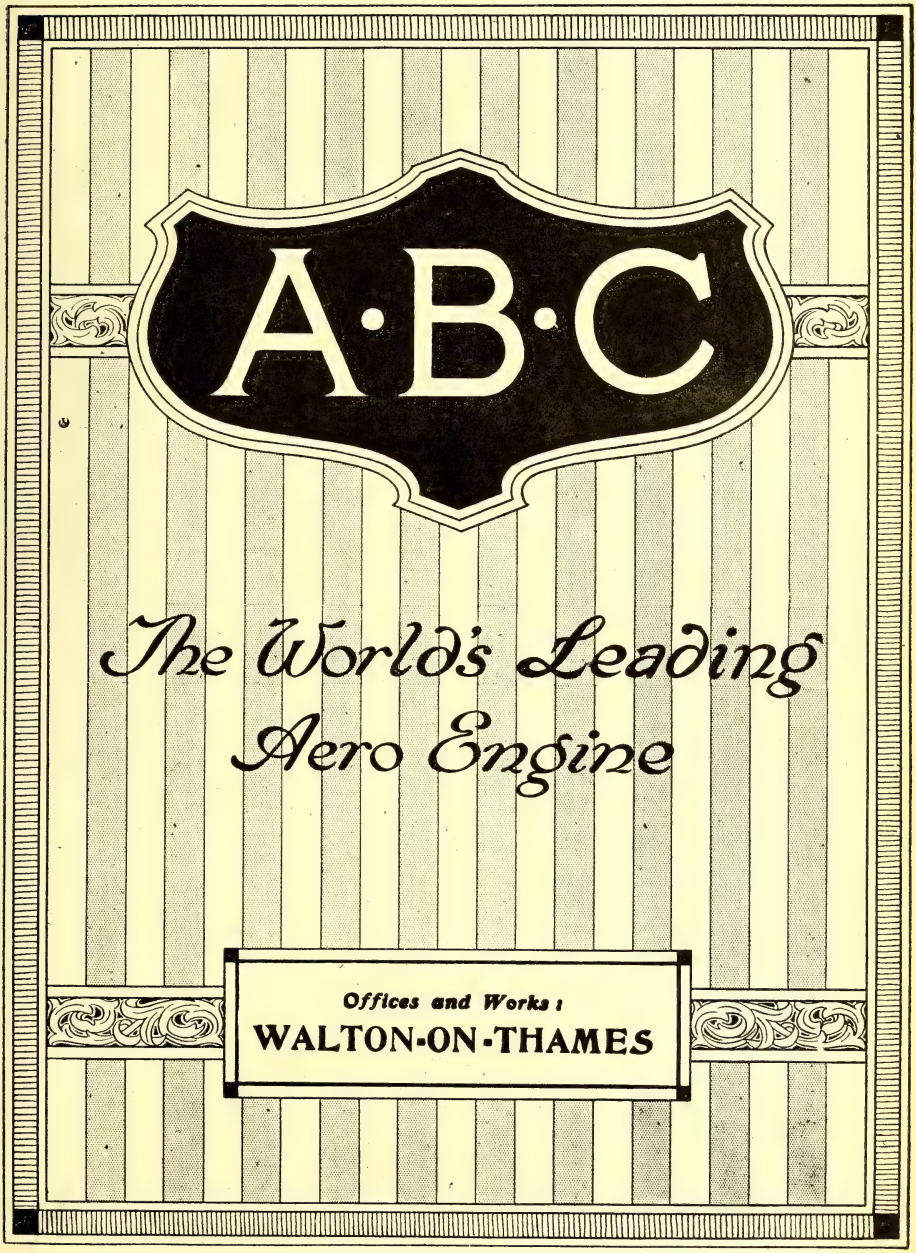
The accompanying photographs show the engine to be of the usual six-cylinder water-cooled type, the bore being 155 mm. and the stroke 200 mm., i.e., 5 mm. less in the bore and 20 mm. longer in the stroke than the 260 h.p. Mercédès engines.

Owing to the damaged condition of the cylinders and pistons it has been difficult to ascertain the exact clearance volume. This is approximately 1,130 c.c., giving a compression ratio of 4·34 : 1, which is lower than any of the previous enemy engines.

Twin inlet and exhaust valves are fitted in the head of each cylinder, and the method of water cooling the exhaust valve stems by an annular passage, which completely surrounds the valve stem guides, is a novel detail of construction in enemy engines.

The valves are operated by an overhead camshaft, running in bronze bearings in a cast aluminium casing; the design of the valve rockers and valve gear is worthy of notice.

An unusual type of compression release gear is used, which is of remarkably simple construction. Aluminium pistons are fitted. These are machined all over, inside and out. The slightly convex crowns are supported by conical pillars which bear upon the centre of the gudgeon pins through the slotted small ends of the connecting rods. This construction, together with the design of the tubular connecting rods, is essentially


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Benz practice, whilst the construction of the steel cylinders is taken from the 260 h.p. Mercédès design, but incorporates several improvements.

A large oil-cooling radiator is attached to the bottom of the crankcase, and is used in conjunction with a new design of duplex-plunger oil pump, which works vertically at the rear end of the crankcase. The design of the oil pump is somewhat similar to that now used on the new 200-h.p. Austro-Daimler engines.

Two separate two-jet carburetters fitted with annular floats are employed. These are apparently equipped with some form of altitude adjustment. Unfortunately, only one incomplete carburetter was found on the engine.

No details can be given of the construction of the water pump, as this component was missing from the engine.

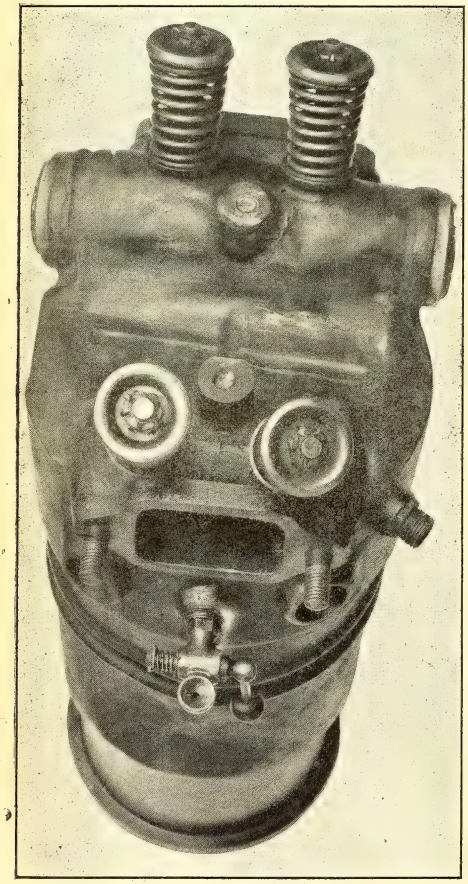
The crankshaft is of ordinary, but exceptionally heavy design. The main journal bearing shells are machined with a screw-thread bedding for the white metal linings in a similar manner to the 300-h.p. Maybach engines. The propeller hub is fitted to a detachable tapered extension piece, which is bolted by a flange to the end flange of the crankshaft.

Further details of the design are given in the following description, and the leading particulars of the engine are shown in the accompanying data, which are as complete as the condition of the engine allows.

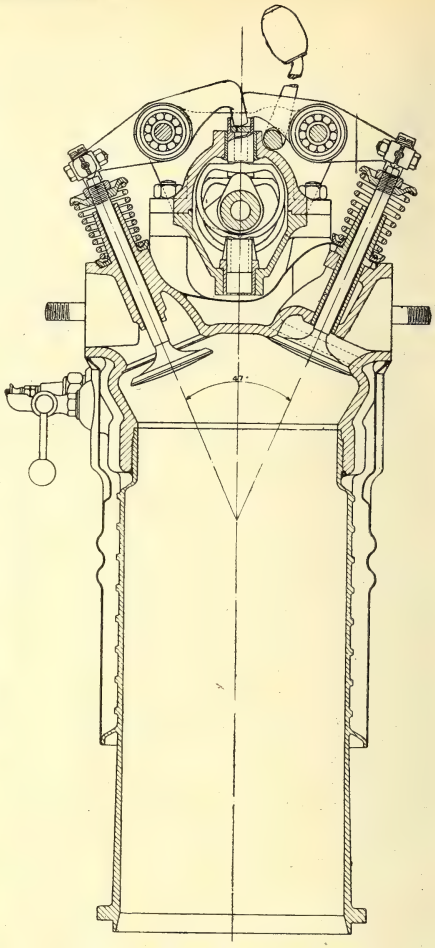
DETAILS OF CONSTRUCTION.

Cylinders

A sectional drawing showing most of the construction of the steel cylinders is given.



View of a Complete Cylinder, from Exhaust Side. The curious gargoyle-face effect of this View is interesting.



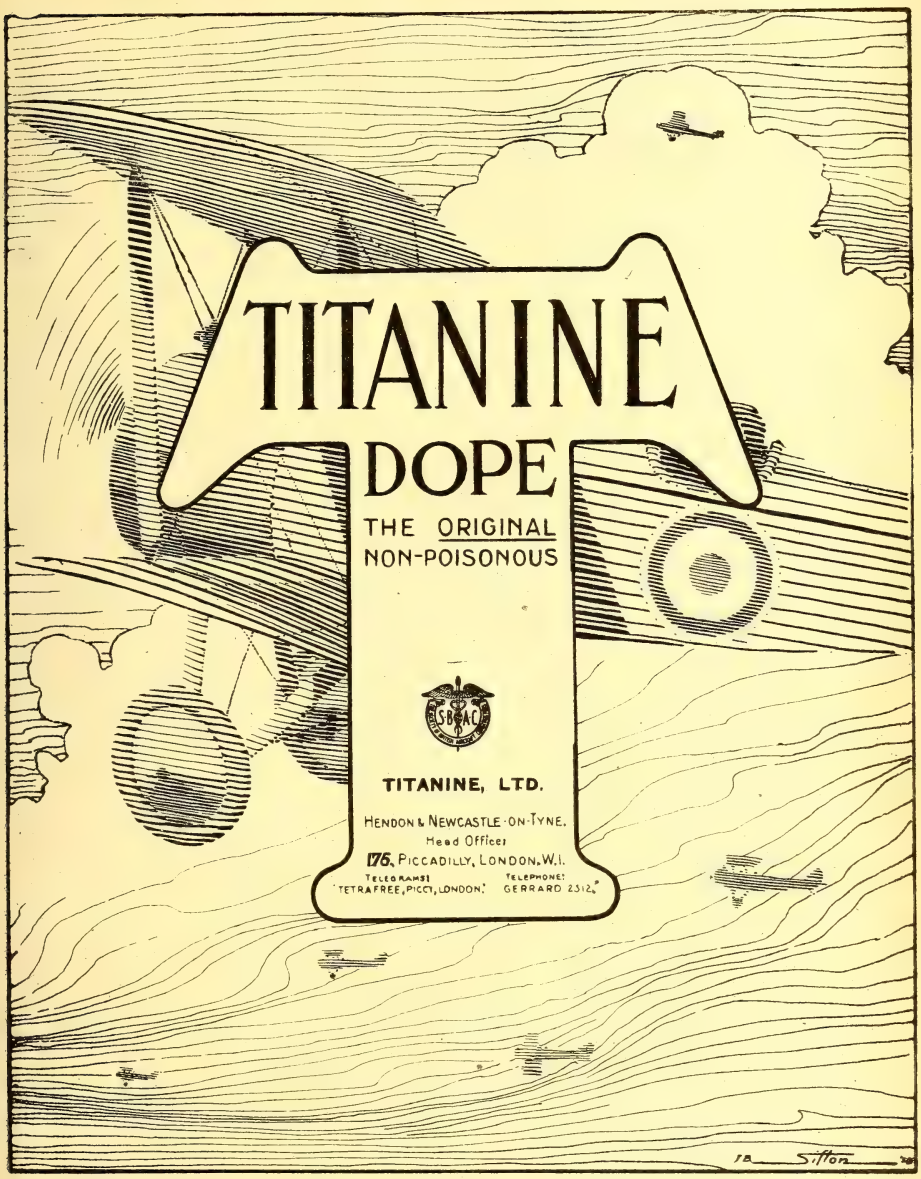
Section of one Cylinder, Bassé-Selve Engine.

The cylinder barrels are screwed into the heads and welded in position. This construction is similar to the 260-h.p. Mercédès, as also are the eight ribs machined on the outside of the barrels.

The cylinder heads are of cast steel, and the four valve pockets in each cylinder are cast integrally with the head. The formation of the combustion chamber and the unusual inclination of the valves at 23.5 deg. to the vertical axis of the cylinder are interesting points. The formation of the water passages in the heads and the construction of the water jackets have evidently received the most careful consideration in this engine, especially in the cooling of the exhaust valves. The cylinder water jacket capacity is remarkably high, and the water passages through the cylinder heads are exceptionally good. The water connections between the cylinders are all on the exhaust valve side, and are of large diameter. The water connections in the cylinder heads are arranged as close up to the exhaust valves as possible.

The construction of the valve stem guides is as follows:—

The valve guides are steel tubes lined with phosphor bronze; they are pressed into the valve pockets, and are acetylene welded in position top and bottom; an annular passage cast in the exhaust valve pocket entirely surrounds the central portion of each exhaust valve stem guide for a distance of 35 mm. The water jackets are of pressed sheet steel, with two annular corrugations, and the bottom joints of the water jackets are welded to bevelled flanges turned on the outside of the cylinder barrels. This joint is of the same design as is now used in the 200-h.p. Austro-Daimler engines.


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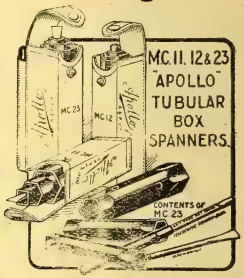
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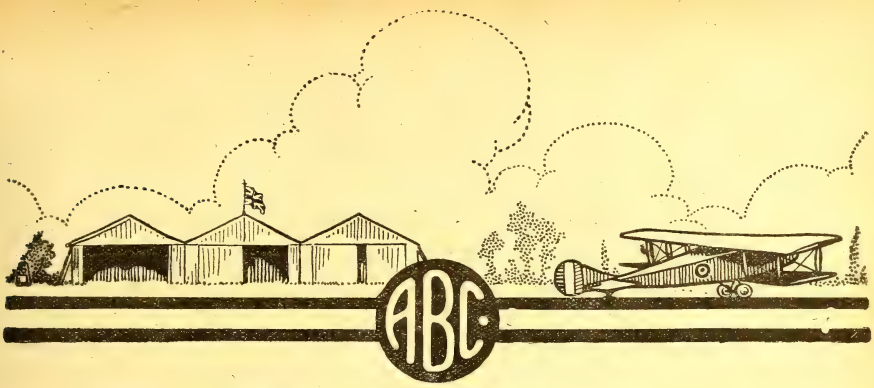
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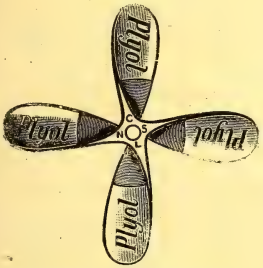
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Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3006.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hampstead 5551.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 2403 and 4424.

Davidson Aviation Co., Ltd., Hammersmith, W.6. Hammersmith 1992 (3 lines).

Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2604 (2 lines).

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176.

Glendower Aircraft Co., Ltd., 54, Sussex Place, South Kensington, S.W.7. "Glenaelle, Southkens, London." Kensington 7605 (3 lines).

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Graham-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.
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Hooper & Co., Ltd., 54, St. James's St., Piccadilly, London, S.W. "Sociable, St. James, London." Regent 912.

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National Aircraft Manufacturing Co., Ltd., 15, Drummond Crescent, Seymour Street, Euston. Museum 3373.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London." Willesden 2455

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Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 103.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 1088 (8 lines).

Standard Aircraft Manufacturing Co., 28, Bow Common Lane, E. East 2823.

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin." Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet." Byfleet 1, 2 & 3.

Thames Aviation Works, 141, Curtain Rd., E.C.2. London Wall 9766.

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Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft, Yeovil "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

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Whitehead Aircraft (1917), Ltd., Richmond, Surrey. "Whitecraft, Richmond, Surrey." Richmond 1780-2.

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Balloons—

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Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London." Museum 496.
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Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds."

Blinds—

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J. Avery & Co., 81, Gt. Portland Street, London, W. "Velarium, London." Gerrard 6620.

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Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic. 4830.

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Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16. Dalston 2500 (2 lines).

Books (Aero Engines)—

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Buildings—

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Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1.

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Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1910.

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Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London" Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 681.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10 "Rodynalite, 'Phone, London." Willesden 2480.

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J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

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Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Bececolin, Cannon, London." City 1206.
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Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1 "Installing, Eusroad, London." Museum 70.
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.
The Pulsometer Engineering Co. Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulviput, Phone, London." Holborn 410
The Smercold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Smercold, Kingston-on-Thames." Kingston 1154.
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.
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Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

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Cashmore Bros, Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs.

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Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham." Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow Tapes, Cords, and Threads. City 3115.

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Eusroad, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—
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The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

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Oils—
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C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—
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The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149

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Propellers (continued)—
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Integral Propeller Co., Ltd., "Aviprop, Hyde, London." Hendon 9. Kingsbury 104
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Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
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The Pegasus Aircraft Co., Ltd., Tytherdown Street, Tooting, S.W.17. Streatham 1242.
Westland Aircraft, Yeovil. "Aircraft, Yeovil" Yeovil 129.

Pyrometers—
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Gallay Radiator Co., Ltd., 198, Great Portland Street, W.1 "Galyradico, Wesdo, London." Mayfair 4826.
John Marston, Ltd., Sunbeamland, Wolverhampton. "Sunbeam, Wolverhampton." Wolverhampton 46 and 206.

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Screw-driving Machines—
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Seaplane Manufacturers—
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Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
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The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Shackles—
British Gold Shell Ring Co., Ltd., Hounslow, Middlesex. "Golshel, Hounslow." Hounslow 254.

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
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Sheet Metal Work—
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Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 2540 (3 lines).
The Smercold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Smercold, Kingston-on-Thames." Kingston 1154



The Aeroplane

Acceptance and Experimental Flights—

The Brodger-Isaac Aviation Company. "Acromnia, 'Piccy, London." Gerrard 578 (2 lines)

Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." 3540 Victoria (3 lines).

Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 220.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle - on - Tyne. "Armstrong Aviation, Newcastle-on-Tyne."

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich, "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 2006.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hampstead 5551.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London" Hampstead 2505 and 3424.

Davidson Aviation Co., Ltd., Hammersmith, W.6. Hammersmith 1692 (3 lines).

Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2604 (2 lines).

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176.

Glendower Aircraft Co., Ltd., 54, Sussex Place, South Kensington, S.W.7. "Glenacelle, Southkens, London." Kensington 7605 (3 lines).

Gosport Aircraft Co., Gosport. "Flight Gosport." Gosport 217

Graham-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.
London Office, 12, Regent Street, S.W.1. Regent 2084.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophid, Crickle, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St. James, London." Regent 912.

Mann, Egerton Co., Ltd., Norwich. "Motors, Norwich." Norwich 282 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet, "Martinsyde, Weybridge" Weybridge 311; Byfleet 171

National Aircraft Manufacturing Co., Ltd., 15, Drummond Crescent, Seymour Street, Euston. Museum 3373.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London." Willesden 2455

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester" Manchester, City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston" Kingston 1088 (8 lines).

Standard Aircraft Manufacturing Co., 28, Bow Common Lane, E. East 2823.

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin" Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet" Byfleet 1, 2 & 3.

Thames Aviation Works, 141, Curtain Rd., E.C.2. London Wall 9766.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyta, Knights, London." Kensington 6870.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5900.

Westland Aircraft, Yeovil "Aircraft, Yeovil" Yeovil 129

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Aeroplane Manufacturers (continued)—

Whitehead Aircraft (1917), Ltd., Richmond, Surrey. "Whitecraft, Richmond, Surrey." Richmond 1780-1.

Witton & Witton, 143, Fouthill Road, Finsbury Park, London, N.4. North 2110.

Airships—

Airships, Ltd., High Street, Merton Wimbledon 1314.

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 378

C. G. Spencer and Sons, Ltd. (See under "Balloons").

The Willows Aircraft Co., Ltd., Cardiff. "Aircraft, Cardiff." Cardiff 300 (main line).

Aluminium Castings (Sand and Die)

Coan, R. W., 270, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 3846.

The Sherecold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Sherecold, Kingston-on-Thames." Kingston 1154.

Balloons—

C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronaut, London." Thames.

Bent Timber Parts—

Dalston 1893.

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Euspuare, London." Museum 466. Also at Market Harborough, Leicestershire "Hoptons, Market Harborough" Market Harborough 15.

Bearings (Etonia Cast Phosphor Bronze)

Brown Bros., Ltd., 61, Eastern St., E.C.1. Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds" Central 3927.

Blinds—

J. Avery & Co., 81, Gt Portland Street, London, W. "Velarium, London." Gerrard 6620.

Blowpipes (Oxy-Acetylene)—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic. 3540 (3 lines).

Bolts—

Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16 Dalston 2500 (2 lines).

Books (Aero Engines)—

Dykes' Auto Encyclopedia, Gillam; 140, Strand, W.C.2

Buildings—

Boulton & Paul, Ltd., Rose Lane, Norwich "Aviation, Norwich." Norwich 851

Rubery Owen & Co., Darlaston, South Staffs.

Cable Coverings and Cable Controls—

The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green." Acock's Green 103 & 104

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

Herbert Terry & Sons, Ltd., Redditch "Springs, Redditch." Redditch 61.

Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4670.

Casein—

T. M. Duché & Sons, 6, Eastcheap. "Duché, London." Avenue 2096.

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3 "Suricodon, Fen, London." Avenue 34 and 35.

Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1306-7.

Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.

Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, 'Phone, London" Hampstead 4403 & 4404.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Aeros, Richmond." Richmond 1681

The Sherecold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Sherecold, Kingston-on-Thames." Kingston 1154.

Thomreon Bros. (Bilston), Ltd., Bradley, Bilston, England "Thomreon Bros., Bilston" Bilston 10.

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafrec, Piccy, London." Gerrard 2312

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 4040

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London" Gerrard 480

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 440

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London" East 955

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford. "Punip, Bedford." Bedford No 1

Arrol-Johnston, Ltd., Dumfries "Mocar, Dumfries" Dumfries 281-282

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd (Salmson), 87, Victoria Street, London, S.W.1. "Aerobucht, Vic, London." Vic 7026

Gordon Watney & Co., Ltd., Weybridge "Mercédès, Weybridge" Weybridge 550 (7 lines)

Green Engine Co., Ltd., Twickenham. Richmond 1203

Gwynnes, Ltd., Hammersmith, W "Gwynne, Hammersmith" Hammersmith 1910.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London." Gerrard 8026

Rolls-Royce, Ltd., 13 and 15, Conduit Street, W.1. "Rolhead, London."

Gerrard 1634-5-6

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 985.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames "Motors, Walton-on-Thames" Walton-on-Thames 220

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1984

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7 "Juno, London." Central 2207; London Wall 1504.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eustoad, London" Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham" Midland 981

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10 "Rodynalite, 'Phone, London." Willesden 2480

Electric Cables—

E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 248

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1504.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1504.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W. "Installing, Eustoad" Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London" Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch "Springs, Redditch." Redditch 61.

Fluxes—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng



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Flying Boat Builders—

Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Flying School—

The L. & P. Aviation Co., Stag Lane Aerodrome, Edgware. "Kingsbury 102. Avenue 995, 996, and 7996.

Furniture (Office)—

Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6170.

Galvanising—

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—

J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.

Voucher, Co., Auto Tool Works, Walsall "Voucher Walsall" Walsall 0196

Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham."

Glue—

Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Bececofin, Cannon, London" East 407

Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Bececofin, Cannon, London" City 1306.

Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid.) "Exeroiden, 'Phone, London." Avenue 4611-2.

Meudine Co., 8, Arthur Street, E.C. Bank 5873.

Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London" Regent 1340

Hack Saw Blades and Machines—

Victor Saw Works, Ltd., 2 and 3, West Street, Finsbury Circus, London, E.C. "Vicsaw, Phone, London" London Wall 1880

Heating and Ventilating—

Chas. P. Kinnell and Co., Ltd., 65 & 654, Southwark Street, London, S.E.1. "Kinnell, London" Hop 372 (2 lines).

The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1 "Hot Water, Friars, London" Hop 703.

Hollow Spars—

McGruer Hollow Spar Co., Ltd., Commercial Road, Lambeth, S.E. "Ollosparsh, Watloo, London" Hop 718.

Instruments—

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London" Walthamstow 189.

Leather for Aeroplanes—

George Angus & Co., Ltd., Newcastle-on-Tyne. City 74. Central 9507. Quayside City 74.

Leather Cloth—

New Pegamoid, Ltd., 134, Queen Victoria Street, London "Pegamoid, Cent, London." City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—

W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines.)

Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch "Springs, Redditch." Redditch 61.

Magnetos—

The British Lighting & Ignition Co., Ltd., 704, Tottenham Court Road, W.1. "Vicksmag, Phone, London" Museum 430.

The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asteroidal, Coventry." Coventry 278.

The M.L. Magneto Syndicate, Ltd., Coventry. "Coriton, Coventry." Coventry 1008-1009.

Metal Casement Manufacturers—

Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham" Central 999 (2 lines).

Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4 "Reconciled, Cannon, London" City 6342.

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London" Avenue 995, 996, & 7996.

Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Aircraft Supplies Co., Ltd., Ascot House, 125, Long Acre, W.C.2. "Upcast, Rand, London." Gerrard 276 (2 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.

Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1 "Installing, Eustoad, London." Museum 70.

Rubery Owen & Co., Darlaston, South Staffs.

Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvinult, Phone, London." Holborn 410

The Sherecold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Sherecold, Kingston-on-Thames." Kingston 1154.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London" Regent 1181.

The Volute Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—

Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast" Belfast 4031-4034-4035.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London" London Wall 6306.

Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham" Central 793.

MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow Tapes, Cords, and Threads. City 3115.

Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries" Dumfries 281-282.

Mann, Egerton & Co., Ltd., 2597-31, Euston Road, London, N.W.1. "Manegecar, Eusroad, London." Museum 70.

Standard Motor Car Co., Coventry "Flywheel, Coventry" Coventry 530 (4 lines).

Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340

Oils—

C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London." Central 11305 & 13466.

Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267

C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield" Sheffield 2149

Presswork—

Rubery Owen & Co., Darlaston, South Staffs.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich" Norwich 851

Propellers (continued)—

Elbora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames "Elbora, Kingston." Kingston 672

Integral Propeller Co., Ltd., "Aviprop, Hyde, London." Hendon 9. Kingsbury 104

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 530-531

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 282 (4 lines).

Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8

The Pegasus Aircraft Co., Ltd., Tetterdown Street, Tooting, S.W.17. Streatham 1242

Westland Aircraft, Yeovil. "Aircraft, Yeovil" Yeovil 129.

Pyrometers—

The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 26

Radiators—

Gallay Radiator Co., Ltd., 198, Great Portland Street, W.1 "Galyradico, Wesdo, London." Mayfair 4826.

John Marston, Ltd., Sunbeamland, Wolverhampton. "Sunbeam, Wolverhampton." Wolverhampton 46 and 206

Rawhide Hammers—

Ira Stephens, Whitelands Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—

Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." 466

Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London" City 3811 & 3812

Safety Belts—

C. H. Holmes & Son, 38, Albert Street, Manchester. "Seaholt, Manchester." City 4432

Screwing Die Heads—

Voucher, Co., Auto Tool Works, Walsall "Voucher Walsall." Walsall 0196.

Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch "Inventors, Redditch" Redditch 74

Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Norwich "Motors, Norwich." Norwich 282 (4 lines).

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines)

Short Bros., Rochester "Seaplanes, Rochester." Chatham 627

Supermarine Aviation Works, Ltd., Southampton "Supermarin, Southampton" Woolston 37

Searchlights & Landing Lights

Brown Bros., Ltd., Great Eastern St., E.C.1

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London" 3540 Victoria (3 lines)

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10 "Rodynalite, Phone, London." Willesden 2480.

Shackles—

British Gold Shell Ring Co., Ltd., Hounslow, Middlesex "Goldshel, Hounslow" Hounslow 254

Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)

British Metal (Kingston), Ltd., Kingston-on-Thames.

Rubery Owen & Co., Darlaston, South Staffs

Sheet Metal Work—

The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830

British Metal (Kingston), Ltd., Kingston-on-Thames. (Staffs.

Rubery Owen & Co., Darlaston, South

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London" Victoria 3540 (3 lines).

The Sherecold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Sherecold, Kingston-on-Thames" Kingston 1154

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Solder Manufacturers—

Samuel Mercer & Co., 193, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Sparking Plugs—

Brown Bros., Ltd., Great Eastern St., E.C.1 Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 644, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Robinhood Engineering Works, Ltd., Newlands, Putney Vale, S.W.15. Makers of KLG Plugs. "Kaelgee, Phone, London."
Putney 2132-3.

Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch."
Redditch 61 (3 lines).

Steel—

Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham."
Smithwick 224.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield."
Central 4522-3-4.

Steel Stamps and Markings—

John Meerloo & Sons, Cleveland Street, Mile End, E.1. "Dayhur, Phone, London." East 3331 (2 lines).

Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury."
Oldbury 111 (4 lines)

Tapes and Smallwares—

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow.
City 3715.

Timber—

Brown, R. F. & F. W., Wollaton, near Nottingham. Nottingham 1526.
Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London." Museum 496.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough."
Market Harborough 13.

Time Recorders—

Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—

Richard Mather & Son, Shoreham Street Works, Sheffield.
Sheffield 4349.

Turnbuckles—

Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery Owen & Co., Darlaston, South Staffs.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston-road." Museum 70 (4 lines).

Tyres and Wheels—

The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent."
Gerrard 1214 (5 lines).

Undercarriages—

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Varnishes—

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjap, Phone, London." Mayfair 6347 (3 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—

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Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

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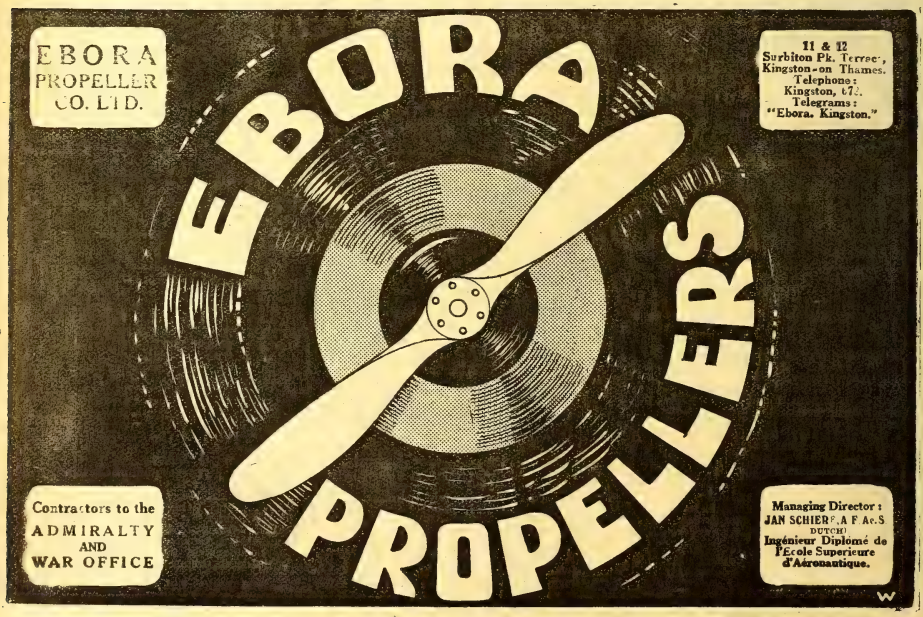
Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield."
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Wirework—

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Woodworking Machinery—

Robinson, Thomas, & Son, Ltd., Rochdale. "Robinson, Rochdale." Rochdale 467.
Sagar, J., & Co., Ltd., Halifax "Sawtooth," Halifax. Halifax 136.
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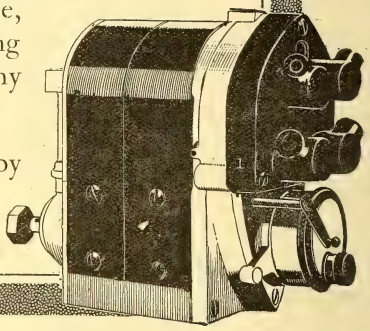
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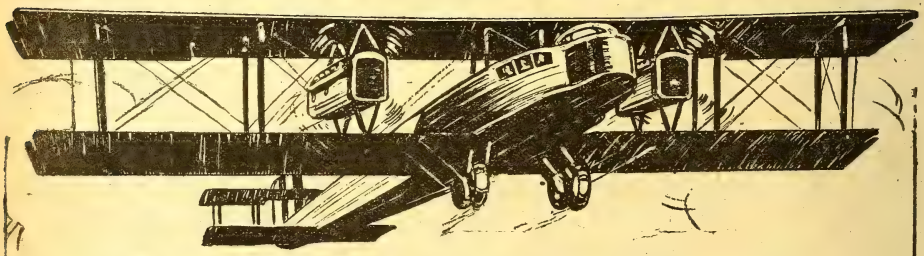
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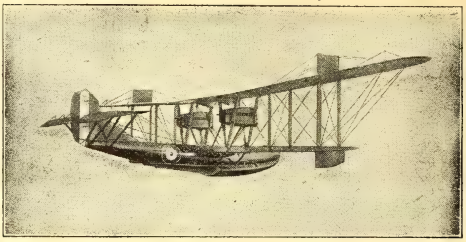
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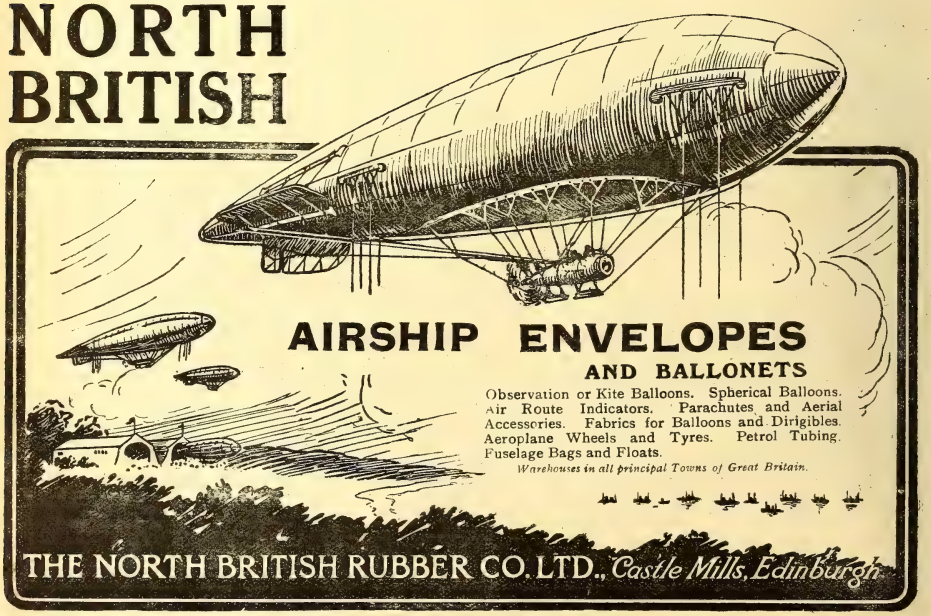
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A water passage is cast in the cylinder heads between each pair of exhaust valves, which allows of water circulation completely around the head of each exhaust valve, and the exhaust valve stems are completely water cooled.

The cylinders are bolted down to the crankcase by steel dogs, which clamp the base flanges of the cylinders at six points. The cylinders are registered in the crankcase by spigots extending 8 mm. below the base flanges.

Each cylinder is held down at six points by means of dogs which clamp the cylinder base flanges on each side. These dogs are secured by studs screwed into the top half of the crankcase.

The main journal bearing bolts, which pass through the top half of the crankcase, are also used to hold down the cylinders by bridge clamps between each pair of cylinders, as shown in a photograph.

The lower halves of the main bearings are integral with the bottom half of the crankcase. Locknuts are screwed on the upper ends of the main bearing bolts beneath the cylinder holding-down dogs, so that the cylinders can be removed without disturbing the main bearings.

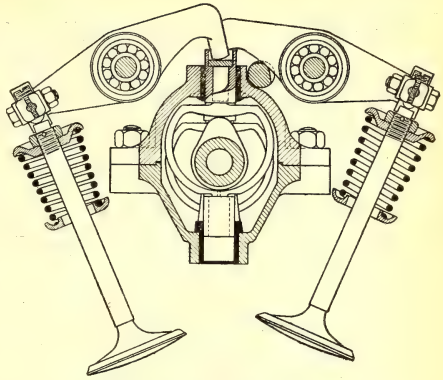
Valves.

The inlet and exhaust valves are of the same diameter in the heads and stems, and of similar section. The valves measure 61.0 mm. across their slightly convex heads. The effective diameter of the valves at the valve seatings is 56 mm. The valve seatings of each pair of valves merge into single inlet and exhaust ports in the cylinder heads. These are rectangular, and the passages are remarkably short and free.

Single valve springs are fitted to each valve, and the wire for the springs is of light gauge (approximately 4.0 mm. diameter). The same design of valve spring is used for both inlet and exhaust valves, but the exhaust springs are more compressed. The ends of the valves stems are screwed to take the spring collars, which are locked by a plain castellated locking nut and split pin.

Valve Gear.

The general layout of the valve gear is shown in the cross-sectional arrangement drawing, and presents some interesting details of design. The camshaft runs in eight comparatively short plain bearings of phosphor bronze, which are held in split aluminium housings of hollow section and large diameter. These are carried in the halves of a cast aluminium camshaft casing, and are located by dowel pegs in the usual way. The camshaft is made in two parts, joined together at the centre by two flanges and four short bolts. This valve gear



Arrangement of Valve Gear.

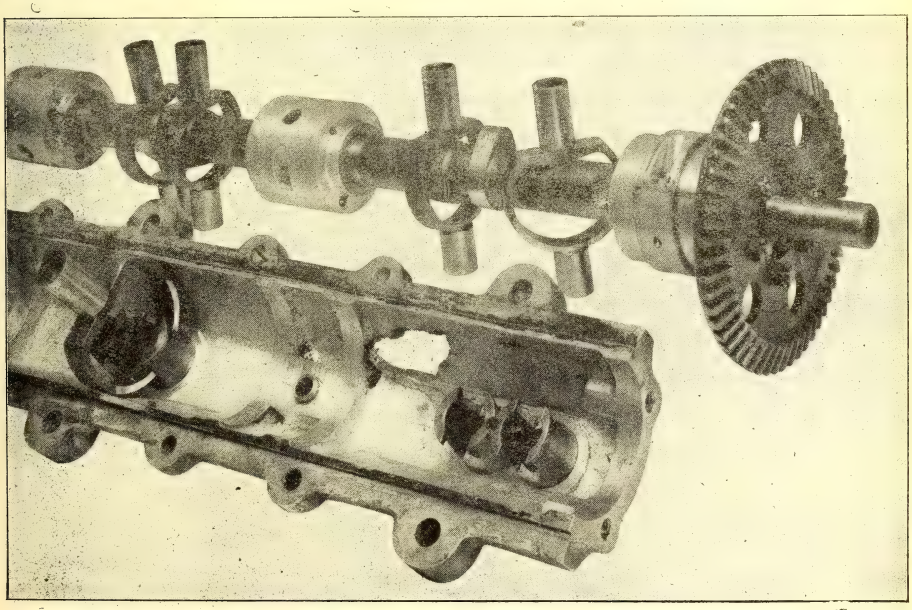
is very similar to that used on the Peugeot racing cars (four valves per cylinder) about seven years ago.

Each pair of valves is depressed by a rocker lever mounted on ball bearings. The inner arm of each rocker lever is operated by its cam through a tappet in the top half of the camshaft casing. The design of these tappets is clearly shown in a cross-sectional drawing, and in a sketch.

The tappets are made in the form of stirrups which encircle the cams, and are supported in bronze bushes at the top and bottom ends. The cams and their tappets are case-hardened, and the camshaft bearings and tappets are lubricated under pressure through the hollow camshaft.

Compression Release.

A simple form of compression release gear is used in place of the usual half compression cams and mechanism. This is operated by means of a rod which lies horizontally along the outside of the camshaft casing directly underneath the exhaust valve rocker arms. This rod has slots cut in it (as shown in a photograph) which lift the exhaust valve rockers when the rod is partially rotated by means of the hand-lever fixed to the



View of part of Camshaft and Casing. Bassé-Selve Engine.

rear end of the horizontal rod. The purpose of this compression release is apparently to facilitate swinging the propeller.

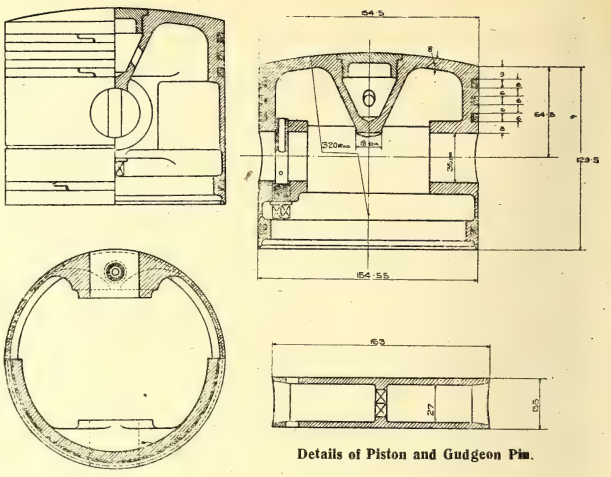
Pistons.

The aluminium pistons are illustrated. The crowns are considerably domed and the pistons are machined all over, both inside and out. Both the material and the machining are excellent.

No ribs are formed on the inside of the pistons, the crowns being supported by a hollow conical pillar which bears on the centre portion of the gudgeon pin, as in the Benz and other engines. This conical pillar is integral with the piston crown. The inside of the pillar is machined through a hole in the centre of the crown which is afterwards plugged with a flanged cap screwed into the centre of the crown, as shown in the drawing. Three cast-iron compression rings are provided above the gudgeon pin and one at the bottom of the skirt, all with stepped joints. The machining processes of this type of piston are obvious from the illustrations.

No bushes are provided as liners in the gudgeon pin bosses. The gudgeon pin is fixed in position by a large hollow set-pin which passes through both sides of the boss and gudgeon pin as shown.

The weight of each piston complete with rings is 5.18 lbs.



Details of Piston and Gudgeon Pin.

Connecting Rods.

These are of tubular section, and closely resemble the Benz connecting rods in design, but are of considerably larger proportions throughout. The inner surfaces of the big-end shells are machined with a fine pitch screw thread to take the white metal liners as in the 300-h.p. Maybach engines. The crankshaft journal bearings are machined in a similar manner. Other details of the connecting rods may be seen in the photographs reproduced. These rods are particularly heavy, the weight of the complete connecting rod being 9.0 lbs.

Crankshaft.

The crankshaft is of normal design, and, apart from its massive proportions, requires no special description. All the hollow crankpins and journals are of the same internal diameter (40 mm.), and are plugged with gunmetal discs expanded into grooves.

All the crank webs are drilled for lubrication with oil passages connecting the hollow crankpins and journals.

A large double-thrust ball-race is fitted to the front end of the crankshaft by means of a shoulder machined on a flange just behind the propeller hub; the thrust races are threaded on over the cranks, and are secured by a large screwed collar and spring locking ring. The main distribution bevel gear floats on the splined rear end of the crankshaft, and is fitted with a thrust ball race between the bevel and the rear end of the journal bearing.

(To be continued.)

A Distinguished Company.

It is announced that Lieut.-Col. Alec Ogilvie, C.B.E., F.R.Ae.S., has relinquished his appointment with the Technical Department, Air Group, and is resuming his professional duties as consulting aeronautical engineer, at Gwydir House, 104, High Holborn, W.C.1

He is associating himself, under the style of Ogilvie and Partners, with the following, who were lately in the same department:—Lieut.-Col. W. A. Bristow; Major R. H. Mayo, O.B.E., Mr. A. J. Sutton Pippard, M.B.E., A.M.I.C.E., F.R.Ae.S., Mr. F. P. Walsh, A.F.R.Ae.S., and Mr. H. C. Watts, M.B.E., F.R.Ae.S.

Colonel Ogilvie himself will be remembered as one of the earliest pioneers of British Aviation, having experimented with a Wright biplane at Camber, near Rye, Sussex, in the Autumn of 1909. He brought the machine from the United States after having visited the Wright Brothers there.

He represented the Royal Aero Club in the Gordon-Bennett Race at Eastchurch in 1911, on a racing Wright of his own building, and fitted with an N.E.C. two-stroke engine. Later he visited the Wright Brothers again, and made a world's record for gliding by remaining in the air for 9 minutes, soaring in an up-current from a sand-hill at Kitty Hawk, U.S.A.

Late last year he had a serious accident, being the sole survivor of a crash of the first four-engined British machine. He joined the R.N.A.S. early in the war, and saw much active service in France. During the last year of the war he was in charge of Applied Design at the Technical Department, Air Group, Ministry of Munitions.

The Ricci Seagull.

Mr. John Wilmot writes:—

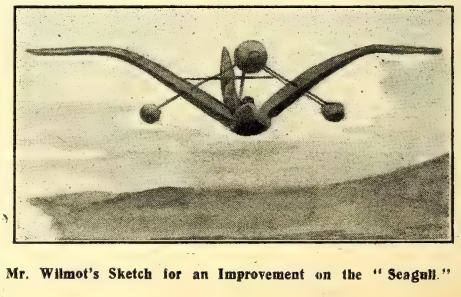
"A certain unnamed correspondent in the issue of March 12th, with his statements about 'impossible machine,' and the position his wing-tip floats are slung from, has fired me both to spoil your eyesight (however good it may be) with my sketch, and to try your patience still more.

"In my feeble opinion, the machine possesses undoubted advantages, both in aerodynamic design and also in strength and easiness of construction. Firstly, the struts connecting the engine-cowl would have to be widened considerably, and be provided with an extension to which streamline 'wing-tip' floats would be fixed. This construction, coupled with the depth of the wing section, is bound to be abnormally strong, and if the remaining wing structure were folded back on either side, the housing space need not be very large.

"Again, the unknown's statement about the essence of lift in the strongly 'dihedraled'—and, of course, highly cambered—portion of the wing. A seagull, at any rate, gets a tremendous amount of lift out of it. Also the wind thrown out by this dihedral must naturally be 'cupped' at the curve, thus exerting a good deal of extra pressure and lift under the wing-tips.

"Most likely the foregoing is absolute rot, but I would sooner have the 'wing-tip' floats as per my own sketch than dangling gracefully from the weakest part of the wings, as they would prevent the machine rolling overmuch, while the height of the wing-tips themselves would prevent them going anywhere near the water.

"Anyhow, I should think the machine could be made very compact and neat, with steel tube spars and almost complete absence of wing-bracing, while the speed should be tremendous."



Mr. Wilmot's Sketch for an Improvement on the "Seagull."



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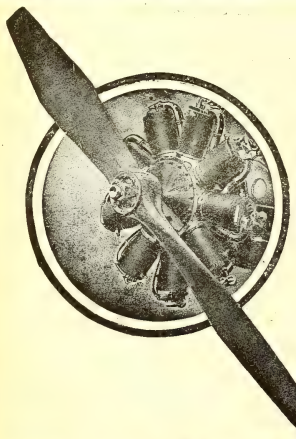
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PATENTS INDEX.

The subjoined list of recent inventions has been specially compiled by The Aeroplane from the current Official Patents Records :—

Patents Applications.

Alden, F. Airships. No. 5222. March 3rd.
Badger, L. Brake for air- and seaplanes. No. 5359. March 4th.
Bettica, A. Multiple bomb for aeroplanes. No. 5506. March 5th.
Birkbeck, T. E. Dirigibles. No. 5763. March 8th.
Brown, F. A. Level-indicating device for aircraft. No. 5186. March 3rd.
Cramp, R. Aviation. No. 5373. March 4th.
Davies, T. E. Parachute attachments for aeroplanes. No. 5532. March 6th.
Gaynor, T. F. Aircraft ground contactor. No. 5680. March 7th.
Henderson, G. L. P. Aeroplane hangars. No. 5666. March 7th.
Hines, W. P. Level-indicating devices for aerial machines, vessels, etc. No. 5254. March 3rd.
Orfeur, J. H. Clinometers for aircraft. No. 5491. March 5th.
Orman, F. R. Aeroplanes. No. 5653. March 7th.
Pecknold, H. Appliance for inflating airships with hot air. No. 5517. March 6th.
Pidcock, C. W. Airships. No. 5820. March 8th.
Ricci, E. Waterplanes or hydro-aeroplanes. No. 5364. March 4th.
Sayers, W. B. Method of forming sheet metal structures for aircraft, etc. No. 5447. March 5th.
Appelbee, G. P. Control of aircraft. No. 7228. March 22nd.
Batchelor, J. H. Aeroplanes. No. 6875. March 19th.
Blackburn Aeroplane and Motor Co. Maintaining contents of cases, reservoirs, etc., carried by aircraft at any required temperature. No. 6966. March 20th.
Bonnard, L. H. Aeroplanes. No. 6792. March 18th.
Boothby, F. L. M. Airships. No. 7025. March 20th.
Burns, W. A. Airships. No. 7097. March 21st.
Caproni, G. Flying machines. No. 6635. March 17th.
Caproni, G. Flying machines. No. 6630. March 17th.
Cawdery, J. W. Parachutes. No. 6562. March 17th.
Fairey Aviation Co. Hydro-aeroplanes. No. 7101. March 21st.
Green, F. M. Fittings for metal framework of aeroplanes, etc. No. 6976. March 20th.
Gearins, A. J. E. Two-stroke radial aero engine. No. 7085. March 21st.
Lobb, H. B. Toy aeroplanes. No. 6991. March 20th.
Low, A. M. Aeroplanes. No. 6877. March 19th.
O'Gorman, M. Motive-power installations for aircraft. No. 6874. March 19th.
Prendergast, G. M. Propellers. No. 6750. March 18th.
Motte, R. C. Sheet metal bodies for aeroplanes, boats, floats, etc. No. 7076. March 21st.
Ridgway, A. E. Weight-supporting parachutes. No. 6973. March 20th.
Sherrin, G. C. Air-speed indicators. No. 7133. March 21st.
Slingo, C. W. Brakes for aircraft, etc. No. 7165. March 22nd.
Slingo, C. W. Surface for landing-grounds of aircraft, etc. No. 7166. March 22nd.
Tarrant, W. G. Elevator planes of aircraft. No. 7103. March 21st.
Theodorescou, A. Road for aero transport. No. 6989. March 20th.
Bijur Motor Appliance Co. Starting-apparatus for aeroplane engines, etc. No. 7301. March 24th.
Blackburn Aeroplane and Motor Co. Aircraft fuselages, hulls, etc. No. 7438. March 25th.
Blackburn, H. Release hooks for parachutes, etc. No. 7564. March 26th.
Constable, T. Airship shelters and stations. No. 7437. March 25th.
Croxon, W. Toy parachutes. No. 7360. March 24th
Gibson, T. S. Means for cleaning wind-screens and windows of motor vehicles, aircraft, etc. No. 7285. March 24th.
Gillespie, B. Aeroplanes and submarines. No. 7262. March 24th.
Goodwill, G. Instruments for ascertaining speed of aircraft. No. 7310. March 24th.
Goodwin, H. A. C. Means for indicating course, linear velocity, bearing, and ground range of aircraft and for fuse-predicting. No. 7627. March 26th.
Hill, F. W. Clinometers for aircraft. No. 7903. March 29th.
Hooper, F. J. Swivelling brackets for mounting electric generators on aircraft. No. 7316. March 24th.
Hunnable, A. Airships. No. 7813. March 28th.
Janson, E. C. Aero-motors. No. 7957. March 29th.
Luboshez, B. E. Device for obtaining lateral control and stability of aircraft. No. 7424. March 25th.
Pearce, J. T. Aeroplane propellers. No. 7969. March 29th.
Phillips, J. S. Aeroplanes. No. 7372. March 25th.
Pickles, S. Radiators for aircraft. No. 7963. March 29th.
Pickles, S. Garments for use in rarefied atmospheres. No. 7964. March 29th.
Pointing, A. G. Aeroplanes. No. 7495. March 25th.
Vickers, Ltd. Fabrics for airships. No. 7465. March 25th.
Vickers, Ltd. Cars for aerial machines. No. 7487. March 25th.
White, J. W. Launching and landing heavier-than-air craft. No. 7886. March 29th.
Wilson, H. H. Device for radiator-warming of motor-car and aeroplane bodies. No. 7388. March 25th.
Wood, B. G. Aeronautics. No. 7506. March 26th.
Worman, W. M. Aeroplanes, etc. No. 7926. March 29th.
Worman, W. M. Aeroplanes, etc. No. 7927. March 29th.

Complete Specifications Accepted, prints of which can be obtained on and after March 27th, 1919.

23,502. Dec. 3rd, 1914. Molesworth. Means for directing the dropping of bombs or projectiles from aeroplanes or airships.
23,790. Dec. 9th, 1914. Edwards. Guns on aeroplanes.
24,351. Dec. 19th, 1914. Wells. Sighting-device for use on aircraft.
704. Jan. 16th, 1915. Jeffries, E. H. Line-travelling mines or torpedoes and the like.
3009. Feb. 24th, 1915. Molesworth. Means for directing the dropping of bombs or projectiles from aeroplanes or airships.
3428. March 3rd, 1915. Bradley. Sighting-apparatus for dropping bombs from aircraft.
3867. March 11th, 1915. O'Gorman, Waters and Vessey. Apparatus for supporting and releasing bombs or other bodies from aircraft.
3887. March 11th, 1915. Barr and Stroud. Sighting-apparatus for use in dropping bombs from aircraft.
5608. April 14th, 1915. Temple. Instrument for determining the speed of aircraft and the proper moment for dropping bombs therefrom.
5750. April 16th, 1915. Cowey. Sighting-devices for use in dropping bombs or other missiles from aircraft.
5915. April 20th, 1915. Wheatley and North British Rubber Co. Fabric for balloon envelopes and the like, and the method of manufacturing and after-treating same.
6698. May 5th, 1915. Portadown Weaving Co., and Greeves. Fabrics applicable for aeroplane and other purposes and aeroplane wings and planes.
6967. May 10th, 1915. Barr and Stroud. Pilot steering-indicators for aircraft.
8438. June 7th, 1915. De Havilland, and Aircraft Manufacturing Co. Gun mounting for use on aircraft.
102,620. Dec. 6th, 1915. Curtiss Motor Co. Hydro-aerial machines.
123,564. Feb. 21st, 1918. Morch, J. J. Propulsion and control of aeroplanes.
123,565. Feb. 21st, 1918. Morch, J. J. Propellers for aerial and other machines.
123,603. March 5th. 1918. Poulsen, C. M. Planes of aeroplane flying-machines.

Complete Specifications Accepted, prints of which can be obtained on and after April 10th, 1919.

13689/15. Sept. 27th, 1915. Williams, and North British Rubber Co. Balloon fabrics, and the like.
13690/15. Sept. 25th, 1915. Williams, and North British Rubber Co. Manufacture of balloon fabrics, and the like.
14060/15. Oct. 4th, 1915. Molesworth. Means for directing the dropping of bombs or projectiles from aeroplanes or airships.
14577/15. Oct. 15th, 1915. De Havilland and Aircraft Manufacturing Co. Means for controlling aeroplanes.
14695/15. Oct. 18th, 1915. Short. Explosion engines particularly applicable to aircraft.
15123/15. Oct. 26th, 1915. White (Curtiss Motor Co.). Flying-boats.
154/65/15. Nov. 2nd, 1915. Peters and Co., and Hibberd. Aerial screw propellers, and the like, and the method of manufacturing the same.
154/99/15. Nov. 3rd, 1915. Hutchins. Apparatus for aiming and dropping or firing projectiles from aircraft.
15625/15. Nov. 5th, 1915. Avery, Ltd., and Gibbs. Instrument for ascertaining the tensional stress in flexible members, such as aeroplane stays, or other like stressed members.
124,012. Feb. 11th, 1918. Valdes y Cortes, S. Driving of ships, boats, windmills, flying machines, and the like.
123,996. March 20th, 1918. Darwin, H. Aeronautical instruments.
124,067. March 21st, 1918. Russell, J., and Kennedy, R. Internal-combustion turbine engines for aeroplanes, seaplanes, airships, and the like.
124,081. April 5th, 1918. Robertson, W. Inclinometers particularly adapted for aircraft.
124,093. April 24th, 1918. Jackson, W. J. Mellersh-. Aeroplane structural elements.

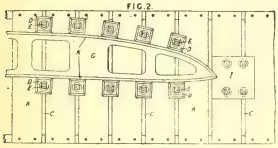
COMPLETE SPECIFICATIONS ACCEPTED, PRINTS OF WHICH CAN BE OBTAINED ON AND AFTER APRIL 17TH, 1919.

16445. Nov. 22nd, 1915. Blackburn Aeroplane and Motor Co., and Blackburn. Devices for use in the manufacture of propellers, more particularly aircraft propellers.
17141. Dec. 6th, 1915. Sage and Co., and England. Manufacture of certain parts of aircraft.
17385. Dec. 11th, 1915. Vickers, Ltd., and Challenger. Bullet deflectors for the propellers of aeroplanes and similar aircraft provided with guns.
17528. Dec. 15th, 1915. Short. Mounting of guns on aeroplane flying-machines and other aircraft.
124225. April 20th, 1917. Laws, F. C. V. Photographic cameras of the type employed on aircraft.
124280. March 21st, 1918. McDonald, T. F., and Naseby, T. W. Device for indicating the backward, forward, and sideward inclination of aircraft and aeroplanes, and for similar purposes.
124286. March 22nd, 1918. Done, J. S. Appliance for lifting and moving aeroplane cases and similar large packages.
124293. March 27th, 1918. Burn, L. Devices for minimising the effects of acceleration upon compasses and inclinometers.
124355. July 11th, 1918. Channon, F. W. Aerial propellers.
124363. July 28th, 1918. Walsh, F. F. P. (Swan, P.). Aircraft control.

ABRIDGMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.

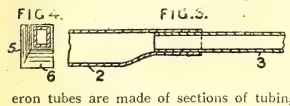
122,060 Jigs for making aeroplane ribs, etc. LIGHTMAN, L., 89, Harehills Avenue, Leeds.

A jig, particularly for use in securing edge frames to the ribs of aeroplanes, comprises a base having a series of parallel cross slots over each of which is a pair of plain square blocks carried by bolts passing through the slots so that the blocks may be adjusted to suit ribs of different contour. The base may be of wood and comprise separate strips A spaced apart to form the slots C, or may be of cast iron and provided with slots extending only part way across it. A templet of the rib is placed on the base and the blocks D adjusted to its periphery and secured by the bolts E. The templet is then removed and the rib G with the glued edge frames K placed on it is pressed down by hand between the blocks and the frames K are then screwed or nailed to the rib. Blocks I may be provided to engage the ends of the ribs and the lower face of the blocks is preferably covered with sand-paper.



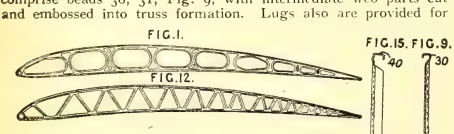
122,647. Aeronautics. RAPP, J. W., College Point, New York, U.S.A.

CARS; FRAMEWORK.—The fuselages of aeroplanes are composed of steel tubular longerons of rectangular cross-section connected together by cross-stays and struts of similar tubes. The longeron tubes are made of sections of tubing of different dimensions telescoped and welded together. Figs. 3 and 4 show a joint for two sections of longeron tubing, the larger section 2 being reduced at the end for welding to the next section 3. The reduction of the section 2 is effected only on the two inner sides 5, 6, so as to retain the external contour.



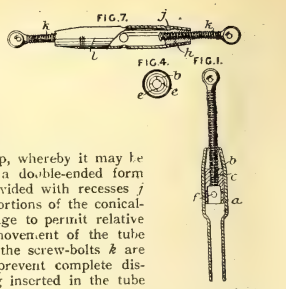
122,649. Aeronautics; girders. RAPP, J. W., College Point, New York, U.S.A.

Aeroplane ribs are formed from a single sheet of metal and comprise beads 30, 31, Fig. 9, with intermediate web parts cut and embossed into truss formation. Lugs also are provided for attachment to wing spars. The web portions may be formed as shown in Fig. 1, of W-section, or as shown in Fig. 12, of V-section, with beads 40, 41, Fig. 15.



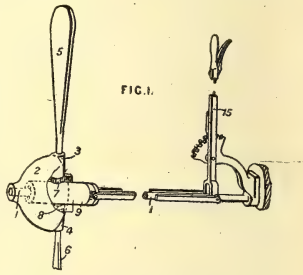
122,325. Wire and rod strainers. FRANCE, A. G., 64, Chancery Lane, London.

Relates to screw turn-buckles, applicable for straining aircraft stay-wires, and consists in effecting the locking of the screw by means of co-operating conical surfaces. In the form shown in Fig. 1, the attachment stirrup *a* is formed with a hollow conical sleeve *b*, and the nut *c*, situated within it, also is made taper and has radial slits *e*, Fig. 4, enabling it to be sprung slightly. The nut has a square aperture for the insertion of a rotating-tool, and tommy-holes *f* for a like purpose. Alternatively, the nut may have a squared, etc., part projecting beyond the conical portion of the stirrup, whereby it may be rotated. Fig. 7 illustrates a double-ended form wherein the nuts *h* are provided with recesses *j* with which punched-down portions of the conical-ended straining-tube *l* engage to permit relative axial, but prevent rotary, movement of the tube and the nut. The ends of the screw-bolts *k* are preferably riveted over to prevent complete disengagement, the nuts being inserted in the tube before the ends of the latter are swaged or rolled to the conical shape.



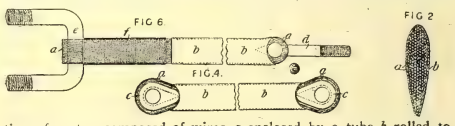
122,302. Screw propellers. THOMPSON, J. E., Paisley, Ontario, Canada.

In an aeroplane propeller, the blades are journaled in radial sleeves 3, 4 carried by a cone-shaped bearing member 2 secured at its apex to the propeller shaft 1. A sliding sleeve 9 on the shaft 1, and operated by the lever 15, has tangential racks which gear with corresponding pinions 7, 8 on the blades 5, 6.



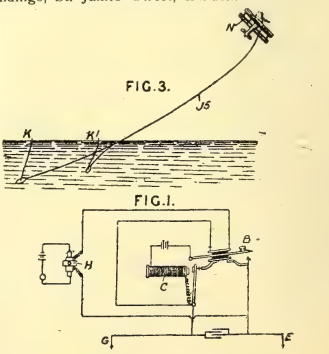
122,506. Stays for aircraft framing, etc. SAUNDERS, LTD., S. E., and THOMAS, H. H., Columbine Works, Medina Road, East Cowes, Isle of Wight.

Stays or tension members for use in aircraft, bridges, or other structures are constructed of several wires laid parallel to one another within an outer covering, the whole being subsequently drawn or rolled to the desired section. Fig. 2 shows a cross section of a stay composed of wires *a* enclosed by a tube *b* rolled to streamline form. Fig. 4 shows such a stay formed with end fittings, by wrapping the wires round eyes *c*; or the end fittings may comprise a stirrup bolt *e* and a T-bolt *d*, Fig 6, the ends of the wires *a* being secured by wire binding *f*. The wires *a* may be treated with bitumen, paraffin, etc., which fills the interstices.



122,657. Signalling to and from aircraft. HARVEY, T., 10, Newton Terrace, Sauchiehall Street, Glasgow, and TULLOCH, T. G., Bank Buildings, St. James' Street, London.

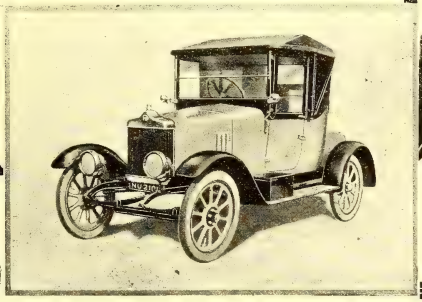
For communicating to and from aircraft flying over the sea, two earth-plates spaced apart are suspended in the water from the aircraft by an insulated cable or cables. Fig. 3 shows an aeroplane N from which the earth plates K, K¹ are suspended by a double-core cable J⁵. The double-core cable may be replaced by two separate cables. The transmitting and receiving apparatus shown in Fig. 1 comprises a sending-key B and a make-and-break switch C arranged to send impulses to the circuit connecting the earth plates G, E.



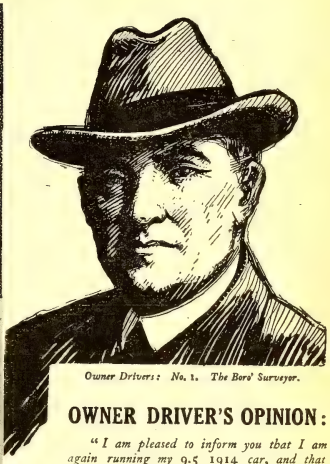
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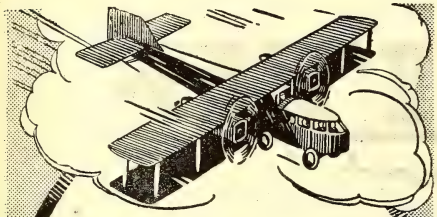
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MARKET TOPICS.

PRICES ARE FOR QUANTITIES ON USUAL TERMS.

COPPER.—The general position of this market is fairly good and consumers are showing more interest, and prices are becoming firmer; this alteration in the position may be due to alteration in the American Exchange, higher freights, and the possibility of a huge demand on the signing of Peace.

The prices of Electrolytic, B.S., and Standard are now fairly safe, and if anything values will harden. In some quarters it is expected that the prices of manufactured Copper and Brass will shortly advance. It is difficult to see how manufacturers can justify such an action; in fact, as pointed out in these columns previously, even the prices ruling at present are out of all proportion with the prices ruling for ingot Copper after allowing for dearer fuel, increased wages, etc.

COMPARATIVE PRICES.

	Per Ton.
To-day (April 2nd)	£81 0 0
Last week	79 10 0
Last month	75 0 0
Lowest price, 1918	100 0 0

TIN.—There has not been any definite change in this market during the past week. Further supplies have been received recently, but even after taking these into account the available stocks cannot be considered very large. Although consumers are showing a little more interest in the market, there are no signs of real activity.

The position in U.S.A. does not even show signs of improvement, and very little business is being transacted. It is stated that it is intended to supply Germany with Tin when the blockade has been lifted, and should this be done, the supplies sent to this country are likely to be affected.

Speaking generally, the position is rather obscure, and does not encourage confidence.

COMPARATIVE PRICES.

	Per Ton.
To-day (April 2nd)	£220 0 0
Last week	240 10 0
Last month	229 10 0
Lowest price, 1918	240 0 0

LEAD.—Although the stocks held here are still very large, the interest shown during the past week has been fairly good, and at one time there were more buyers than sellers. It cannot be said that there has been keen activity, at the same time there are good indications that the demand will continue to increase with the settlement of the labour unrest. There has recently been some interest shown in forward Lead, and this would indicate that some speculators have an idea that the position of the Government will be weaker about June or July.

The average price at present is £27 15s. cash. Forward Lead has been quoted at June £26 10s., May £27, and one seller even quoted £26 June/July.

STEEL.—Although certain sections of the Steelmakers are busy on Home Trade orders, the position generally is very unsatisfactory. Consumers are simply buying hand to mouth, and on the other hand makers are not anxious to make contracts owing to the present uncertainty, and they will only accept business with all kinds of protective clauses.

It is also understood that they have applied to the Ministry for permission to increase their prices as from April 1st, on the grounds that the shorter working day has considerably increased their costs. This news has caused much concern among buyers, especially when it is considered that Americans have only just made a reduction in their prices, and it is practically certain that if the advance is allowed our export trade will suffer very badly.

In the meantime, although inquiries for Home Trade are very large, they do not mature into definite business, and the position generally could not be worse.

TIMBER.—This market is now entirely free from control, and there is already a fair amount of interest being shown. Prices have declined very considerably during the past month, and it is thought that the extreme limit of the fall in prices has now been reached. The only factor which is still causing anxiety amongst buyers is the huge stock which is held by the Controller, and until it is definitely seen that the market will not be flooded with this Timber the activities of buyers will be to a certain extent hindered.

It is now expected that the demand for Timber of all kinds for Peace trade will begin to increase, and once consumers get into their stride the demand will be very large indeed, and everything points to values hardening.

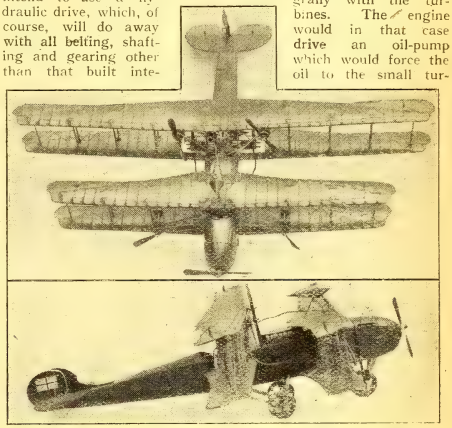
FABRIC.—No definite announcement appears to have been made with regard to the disposal of the huge stocks of Linen Fabric which are held by the Air Ministry. The demand, of course, for Aircraft work is very small indeed, and it looks as though it will be necessary to dispose of the material at a huge loss.

At the same time it is doubtful if prices of Linen Fabric will decline in future as the increase in wages and raw materials indicate that prices will be higher, and those manufacturers who anticipate a fair demand for their aeroplanes will certainly not be unwise in seeing that they hold fair stocks. Some of the stocks held by the Ministry are of very inferior quality, and extreme care is necessary before purchases are made.

An Interesting Experiment.

The accompanying illustration shows a model of a tandem biplane designed and built by the Regent Carriage Co., Ltd., of 126, New King's Road, Fulham, S.W.

The model has a span of about 4 feet with a fuselage length of 3 feet 6 inches. For experimental purposes it has been fitted with a small twin-cylinder double-opposed petrol engine, giving about ¾ h.p. The five airscrews are driven off one shaft with belts for experimental purposes, but in the full-sized machine the makers intend to use a hydraulic drive, which, of course, will do away with all belting, shafting and gearing other than that built integrally with the turbines. The engine would in that case drive an oil-pump which would force the oil to the small turbines attached to each airscrew and there would be special cut-outs so that each screw could be stopped as and when desired.



A Tandem Biplane Model.

The model actually flew on Wimbledon Common and hit the branch of a tree, breaking the screws, but otherwise it suffered little damage. The Regent Carriage Co., Ltd., have taken out patents for various parts of the machine and are prepared to negotiate with any large manufacturer who would care to investigate the proposition which they have to offer.

A Test Flight.

It is announced that during the recent trial flight of R.34, from Glasgow over the Irish Channel and back *via* the Midlands, the airship was fitted with five Sunbeam-Coatalen "Maori 4" aircraft engines, which it is said ran continuously for 19½ hours without giving trouble. Very severe weather was experienced during the trip.

Triplex Safety Glass and Motoring.

It is interesting to note that the new Enfield-Allday light cars are now all fitted with Triplex Safety Glass windscreens as a standard portion of their equipment. This precaution has been taken for the safety of the drivers and passengers, and although it adds slightly to the factory cost, it constitutes a distinct factor in increasing the value of the car.

It is also worthy of note that insurance companies take the fitting of Triplex Safety Glass into consideration by lowering their premiums for road risks when it is employed.

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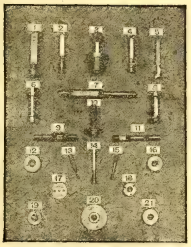
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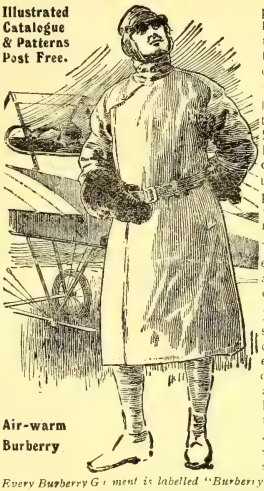
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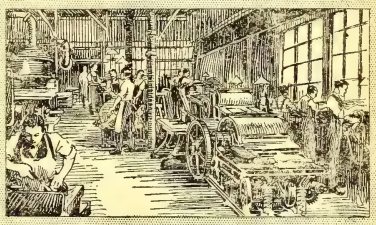
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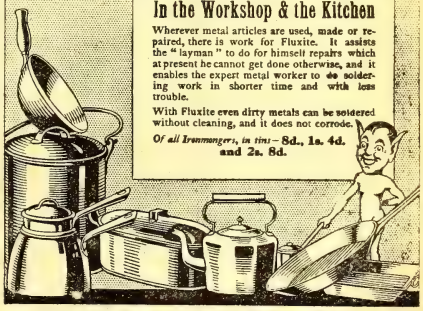
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COMMERCIAL AERONAUTICS & CIVIL AERIAL TRANSPORT

FICTITIOUS FIGURES ON FLYING.

By "ENGINEER OFFICER."

In view of the many inflated statements at present made regarding the cost of flight, I send the following figures, deduced from nearly four years' experience of war, as pilot, engineer officer, and technical officer.

It might appear that the views expressed are pessimistic; but I can only say that I have experimented with models since 1896, made a first hop in 1908, exhibited a model in the Aero Show of 1910, wrote on the future of flying in 1918, and have the fullest confidence in the future. The actual cost must be faced, however, and not camouflaged as at present.

The journey contemplated in the following figures is to a point 5,000 miles away, and the out-and-home route is on one line. The journey is to be done in 500-mile stretches, with a complete aerodrome with workshops, wireless, etc., at the end of each 500-mile stretch, and the machines are to be four-engined biplanes, capable of carrying three-quarters of a ton, by day and night, on 300 days in the year.

Postulated Principles.

Journey.—5,000 miles out and 5,000 miles return.

Speed.—100 miles per hour.

Time for Journey.—4.16 days per round trip, flying day and night.

Flying Days per Year.—300.

Machine Endurance.—One machine does a stretch of 500 miles, and its load is then transferred to a fresh machine.

Machines Required.—Ten actually employed, ten more actually ready for flight in case of breakdown, five extra as spares. Total, 25.

Life of Machine.—One year.

Life of Engines.—180 hours. [Running time, before being rebuilt.—Ed.]

Cost of Machines per Year.—One machine during one year makes a trip every 4.16 days = 72 trips per year = 36,000 miles = 360 hours. This entails two sets of engines per machine per year. The cost of machine is estimated at £10,000, and engines at £2,000 each, making a total of £26,000 for complete machine. The total cost of 25 machines is £650,000, and it is assumed that 10 per cent. may be deducted from this total for value of spare machines left over from previous year, making grand total £585,000.

Average Load.—¾ ton.

Miles Flown per Year.—720,000.

Ton-Miles per Year.—540,000.

Petrol Used.—One gallon per mile at 2s. 6d. per gallon = £90,000.

Oil Used.—One-tenth gallon per mile at 5s. per gallon = £18,000.

Pilots.—Two pilots per machine are allowed for, this number being taken to include for sickness, etc. Each pilot is reckoned at £500 per year, making a total of £25,000.

Aerodromes.—One is required at every 500 miles, and each aerodrome must include shed for three machines, workshop, living quarters, wireless, landing, lighting, etc. The cost of each is taken at £10,000 per year = £100,000.

Insurance.—This is taken at 20 per cent. of cost of machines, wages of pilots, and cost of aerodromes = £132,000.

Offices.—A manager and office are required at each stopping-place, and the yearly cost is estimated at £3,000 = £30,000 total.

Engineers, Riggers.—These are reckoned at 20 per machine, at an average wage of £200 per year, making a total of £100,000.

Car Services.—Reckoned at £2,000 for each stopping-place = £20,000 total.

Total Costs.

Machines	£585,000	= 53%	of total costs.
Petrol	£90,000	= 8%	,, ,,
Oil	£18,000	= 1%	,, ,,
Pilots	£25,000	= 3%	,, ,,
Aerodromes ...	£100,000	= 9%	,, ,,
Insurance	£132,000	= 12%	,, ,,
Offices	£30,000	= 3%	,, ,,
Engineers	£100,000	= 9%	,, ,,
Cars	£20,000	= 2%	,, ,,
	£1,100,000		

Which is £2.04 per ton-mile.

Assuming that a profit of 30 per cent. is required, the cost of flight per ton-mile amounts to 53s. = 0.28d. per pound-mile = 0.018d. per ounce-mile.

Damning Deductions.

It would cost, therefore, 3s. 9d. to send a half-ounce for 5,000 miles. Therefore, transport of a 200-lbs. man over the same distance would amount to £1,150.

The former is a reasonable figure, and comes within commercial possibilities at once; the latter is impossible except for occasional stunts.

One sees figures quoted daily in the Press, and even in books, and these figures vary from 9d. to 4s. per ton-mile. How such figures are arrived at is beyond me, but their effect on the general public cannot fail to damage aviation.

If, as seems possible, a large company were floated in the near future, with prospective profits based on the 9d. to 4s. figures, the general public would subscribe with war-time enthusiasm, and the final results would be comparable to those that occurred at the start of the motor-car industry. Such results would be absolutely disastrous to commercial flying for many years.

Mails can be carried to-day, with reasonable chance of success, *if*, but only *if*, the Government guarantees a daily load (or its equivalent in cash) for a given period of time.

Poor Passenger Prospects.

I can foresee the time when mail aeroplanes, as mail steamers, may carry passengers as extra cargo, but I cannot see a pure passenger service paying at all, unless the world conditions completely alter. A rich man's car, run in a rich man's style, costs some 4s. 6d. per mile to run, and flying, as a mere mechanical problem, costs some 20 times as much as ordinary slow transport.

COMMERCIAL AERONAUTICS.—*(cont.)*

So it must always be—action and reaction are equal—speed has to be paid for—but the future of flying is assured, for light valuable cargo, as aerial transport possesses the quality of speed in a larger degree than any other form of transport.

EDITORIAL NOTE.

[The foregoing article is published because it gives the reasoned and calculated opinions of a very experienced officer, whose faith in aviation is in no way dimmed by his discouraging figures. One believes that in some ways he is over-optimistic—as in his estimate of 300 flying days (and nights) per annum. In other ways he is over-pessimistic—as in his estimate of costs of machines, engines, and aerodromes.

Possibly the truth lies somewhere between his 53s. per mile and super-optimist's 9d. per mile. One would therefore welcome the opinions and estimates of others who are interested in this subject and who have worked out figures on similar lines.—ED.]

Stunts or Business.

To the Editor of THE AEROPLANE.

Sir,—If the article entitled "Stunts or Business" contributed by "Medway" to the issue of THE AEROPLANE dated April 2nd is intended as an irritant, the author is to be congratulated upon his success. Briefly, his contention appears to be that the attempts to fly the Atlantic are foolhardy "stunts" which even if successful would prove nothing and would bring no immediate financial gain to the community.

He states that the public interest in these attempts "is much the same as that of a crowd that goes to watch the lion-tamer, rather hoping that the lion may prove to have been insufficiently tamed." Later he says that he classes the "Trans-Atlantic aeroplane flights with the escapades of people who go over the Niagara Falls in barrels, or do tight-rope performances across the top."

Ye Gods! One wonders if future historians will class these short-sighted views with those of that writer of feeble wit who in the days of our foolish forefathers wrote in the "Times" that he would as soon expect the public to trust themselves to Mr. Congreve's rockets as to tempt Providence by riding in Mr. Stephenson's railway train which was said to attain the appalling speed of 25 or 35 miles per hour.

There might be some excuse for the unenlightened writer living in the turgid atmosphere of an almost barbaric age; there is none for your contributor "Medway," and his remarks deserve the derision that they will receive from posterity.

Imagine a writer in the year 2019 (when ten hour flights from the Old to the New World will be as commonplace as railway journeys to-day) quoting these remarks from the time-yellowed pages of THE AEROPLANE. How his readers, who have experienced the luxury of travelling in the great Atlantic aerial liners, will chuckle over the comment of this journalist who in the dim ages classed trans-Atlantic flying with tight-rope performances.

Through the centuries the world has been cursed with saddle-bag-chair critics who carp at everything that more energetic folk attempt.

"Medway" says:—"There are some things which must be done in order to prove that they can be done. This is not one of them. We could prove the possibility of flying the Atlantic quite easily without doing it, if any such proof were needed. We know the distance, and that same distance could be flown by journeying a certain number of times—say, from London to Paris and back without stopping."

To Hades with such puerility! As well say that in the early days of motor-cars it would have been as effective to run them up and down Brighton front as to organise those wonderful road races from Paris to Berlin, and to other Continental capitals—races that forced the world to realise the possibilities of the then novel "horseless carriage" which had been derided by interested people.

Let me tell "Medway" that the world realises that the crossing of the Atlantic by an aeroplane will be a great human triumph. To bracket brave men who are willing to risk their lives in the attempt with the mountebanks of a country fair will not alter the world's view.

If everyone thought only of immediate gain we should indeed be a poor-spirited and degenerate race. Thank heaven, there are some who can still appreciate the true spirit of the old R.F.C. motto "Per Ardua ad Astra" without asking if there is any commerce to be opened up with the stars!

(Signed) CAPTAIN, R.A.F.

Small Parts Makers and the S.B.A.C.

The following letter has been received:—

Sir,—Following some correspondence recently between ourselves and the Society of British Aircraft Constructors, on the subject of that body approving factors in the Aircraft Industry, also the question of a separate Sectional Committee being appointed, to consider the matters in connection with the manufacturers and suppliers of small parts, we are pleased to note that the Secretary of the S.B.A.C. has now circularised a letter to all members of that body asking their views on the formation of a special Sectional Committee to consider matters particularly touching the interests of the manufacturers and suppliers of small and other parts, i.e., people who undertake repetition work, and do not make or assemble either complete components or complete machines.

I hope that the majority of firms will take the opportunity of seriously considering this matter, because, up to the present time, the Committee of the S.B.A.C. has chiefly been engaged upon considering matters affecting only aircraft manufacturers. They undoubtedly have their hands full with these considerations, but, so far as we know, the part manufacturer or supplier is not represented on the Committee.

It has been suggested that the formation of a special section should be left until a later date, as many firms who, during the war, have been making small parts are reverting to their peace-time trades or going in for manufactures outside the Aircraft Industry. But, on the other hand, in view of the progress which will, I believe, be made in Civil Aviation, during the coming summer, I think that the formation of the section, as suggested now, will give such a Committee time to consider matters and get settled down before the part manufacturers get busy again on aircraft work.

There are many ways in which a Sectional Committee could be of assistance to the members of this branch of the Aircraft Industry, and although during the war a great deal of assistance and information was rendered by the Air Ministry, I believe many difficulties which existed during the war might have been overcome had such a Sectional Committee been in existence to deal with matters which touched the part manufacturers as a whole.

Another point which I would like to mention is that quite a number of firms, who in the past have specialised in the manufacture of metal fittings or parts for the Aircraft Industry, are not at present members of the Society of British Aircraft Constructors, and in a conversation with one or two such firms, who are certainly not unimportant, they have expressed the opinion that they thought that the S.B.A.C. was really only for Aircraft Manufacturers. Therefore, I hope that some of these firms may take the opportunity now of writing to the Secretary of the Society of British Aircraft Constructors, at 1, Albemarle Street, W., intimating their wish to join the Society if a Sectional Committee is formed, as suggested.

For the Motor and Aircraft Supplies Co., Ltd.,
(Signed) G. H. MANSFIELD (Managing Director).

A Severe Test.

One learns with interest that the "Phœnix Cork" flying-boat of the latest type was put through an unusually severe test at the No. 2 Northern Marine Acceptance Depôt at Brough one day last week. She was flown through a gale which was then raging and was afterwards moored out in the open for the three following days and nights, and it was not until 10 p.m. on the fourth night that it was possible to bring her ashore.

During all this period there were snowstorms and heavy rain and a wind which varied between 35 miles and 50 miles an hour, so it is a striking testimony to the soundness of the design that the boat satisfactorily outrode the weather. Not only was the machine quite undamaged when brought ashore, but no water had been shipped although heavy seas were running, caused by the combined effect of the storm and an 8 to 10 knot tide down the Humber.

The experiment proves conclusively the usefulness of the flying-boat from the point of view of its independence of landing grounds, for such a machine can be satisfactorily moored out in the open in weather when it would be extremely difficult to prevent a land machine from being damaged in an aerodrome.

Incidentally, the name of the "Phœnix Cork" seems to have been amply justified, so it may be of interest to explain how the name came to be adopted. The boat was designed and built by The Phœnix Dynamo Manufacturing Co., Ltd., of Bradford, and in arranging the type-names for this class of aircraft the Air Ministry decreed that a name must be adopted by the firm, which name should pertain to some maritime town or city in the British Isles. The Phœnix Company, with a proper sense of the appositeness of things, promptly chose the name "Cork" as representing at once an important maritime city and a sea-going quality eminently desirable in a flying-boat. Apparently the sea-worthiness of the boat has fully justified her name.

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COMMERCIAL AERONAUTICS—(*cont.*)

POST-BELLUM POLICIES.

By The Special Commissioner of "The Aeroplane."

MARTINSYDE, LTD.

On reflection and reviewing my conversation with Messrs. Martin and Handasyde on this subject, I cannot but regret that I was unable to see them separately. I feel I should have got more from them had I seen them individually. Also it would have been of a certain diabolical interest to see if their ideas of the future clashed in any way.

Really, however, it was neither Mr. Martin or Mr. Handasyde whom I saw, but "Martinsyde," which is in all probability as it should be. I hope I have not conveyed any impression of ingratitude to these two gentlemen; if so, it is erroneous, as I am very grateful for the time they spared me. To return to the point, however, it is as "Martinsyde" that I will refer to them, abandoning all attempts to attribute separate statements to either of them. As they are apparently in complete agreement on all points under discussion, at any rate when seen together, it seems only fitting and is so much simpler.

The Finance of Aeronautics.

The conversation began on financial lines, which is of course the basis of commercial aeronautics, and it was from the financial standpoint of the manufacturer it goes without saying. As this affects the production of the aeroplane most suited to commerce, adversity results from the prevention of experimental work owing to heavy taxation. This is not an article on the excess profits tax, but it is evident that if by harsh administration builders and designers are deprived of the wherewithal to risk launching out into new ideas the commercial machine will suffer. Messrs. Martinsyde point out that the excess-profit tax bears hardly on the aeroplane manufacturer, as before the war such things as profits for them did not exist. Therefore, one of the essentials for the successful development of commercial aeronautics is a sympathetic attitude on the part of the Treasury.

The Development of the Large Aeroplane.

With regard to this development the firm, who believe in the large machine, are of the opinion that there is an immense amount of experimental work to be done on this type, and they do not consider that the progress made in the design and manufacture of large machines is in proportion to the amount of work of that nature so far carried out, and that the large machine has really yet to be evolved.

On the multiple engine question they are against the idea of planting engines more or less indiscriminately where they will fit, but regard it as a problem involving an engine-room where it will be possible to cut out an engine which is giving trouble and effect repairs without interfering with the flying of the machine. Gearing of some sort of course would be used, and more than one engine to a propeller.

Flying Clubs.

With regard to the small machine for the owner-pilot, or machines of that nature, Martinsyde's consider that the development of low-powered types is essential to overcome the cost of upkeep, though they suggest a solution to this by the formation of flying clubs, the club to own an aerodrome and a number of machines for the use of members, the club also to provide pilots to take up those who, although not pilots, wish to go for flights. That relatively small machines will be used for mail carriers they also believe, although they do not think that Great Britain is a very suitable country for this work owing to the shortness of the distances and the competition of the existing excellent system of mail trains, or rather the pre-war standard of that service.

They do not fear the competition of airships as they consider the expense involved in the initial cost and maintenance of such debar them from attempting to compete with land and sea forms of transport. In fact, from the freight carrying point of view, they are not optimistic, considering bulk and expense as the chief factors against it. They except the circumstances of the transport of precious stones or metals from inaccessible points, where it might be economically achieved, of course.

Commercial Uses of Aircraft.

Their belief in the commercial value of the aeroplane is undoubted, but they look mainly to passenger and express parcel carrying for revenue. On the question of the use of seaplanes, they consider that with large, multi-engined machines reliability will be so much a feature that floats will cease to be necessary, and that the land machine will entirely supersede the water variety, and that the pilots of the large types will be in much the same position as captains of ships.

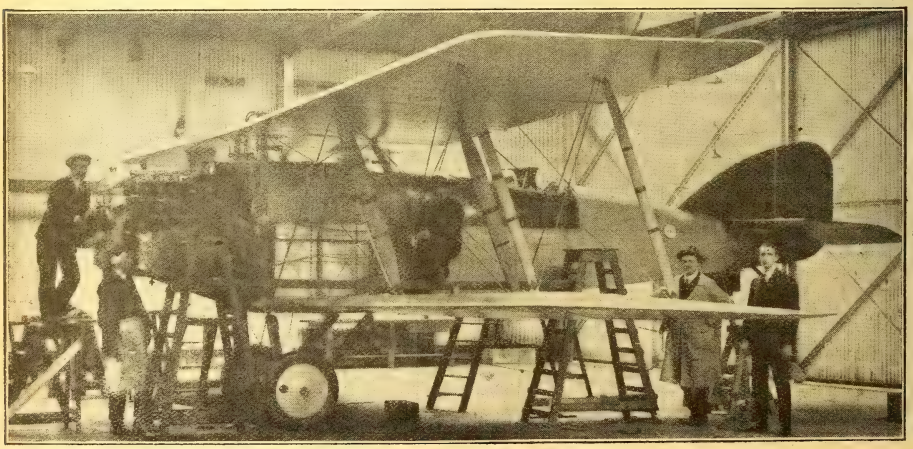
They point out that the war trend of design has not favoured the construction of commercial machines, and that they do not consider war machines to be suitable for commercial work. This really amounts to belief in the necessity for designing and building special machines for trading, whether with passengers or parcels.

Competitions.

That they will enter for competitions that are reasonable I am assured; indeed, I saw the fuselage of one machine which I am inclined to think is intended for that use. Before concluding, I should like to add that the factory over which I was shown is remarkably equipped in every way; indeed, it is most impressive, and shows no sign of being built to cope with war necessities only. It is really a kind of monument to their faith in the future of the industry. Most people connected with aerial matters know the work turned out by the Martinsyde Company, and here one sees how the finish and excellence are obtained. I like to see these good, solid factories; they do more to impress one with the stability of the future of the aeroplane and its possibilities in commerce than anything else.

A New Central Commercial Department.

The firm of Sir W. G. Armstrong, Whitworth and Co., Ltd., has formed a Central Commercial Department with headquarters at 8, Great George Street, Westminster, S.W.1, and this Department will from now and onwards control the commercial handling of the engineering products manufactured by all departments.



THE TRANS-ATLANTIC MARTINSYDE.—Assembling the "Raymor" in the Martinsyde Works at Woking

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CIVIL AERIAL TRANSPORT NOTES.

United Kingdom.

The Bournemouth Aviation Company intend to extend their summer coastal flying service to Weymouth, and probably to Torquay.

It is proposed to establish an aerial service between London and Harrogate in May. The service will be extended subsequently to Scotland, and the journey will be made in two stages and by two machines.

Mr. F. J. C. Broome, the general manager of the wells and baths at Harrogate, who has been negotiating with the Aircraft Travel and Transport Co., is arranging for London evening newspapers to be sold in Harrogate on the day of publication.

The Mayors of Hastings and Tréport are endeavouring to organise a seaplane passenger service between the two towns.

France.

The aerial postal service which was established between Paris and Bordeaux on March 23rd is working satisfactorily, in spite of occasional unfavourable weather. On one occasion the journey of 500 miles was covered in a non-stop flight of three hours and 25 minutes.

On April 6th, when the Farman passenger-carrying aeroplane was leaving Paris for Brussels, the passengers were examined, for the first time, by the customs officials. The officials were French agents acting on behalf of the Belgian Government, as that Government has not yet organised an aerial customs service.

Italy.

On April 6th an airship of a large type began a regular passenger service between Rome and Naples. The ship carries 36 passengers.

The preparation of the C. triplanes for commercial use is apparently a rather radical matter. I understand that four motors are considered necessary, two of them working together in couples for balancing reasons, the need for more than one reserve engine being also a reason for the change.

On March 16th one of Caproni's Mail Packets, carrying a King's Messenger and five other men back from Vienna, had to choose between alighting in the Isonzo and landing between two trees. This latter alternative saved a complete crash, though all the passengers were more or less injured. The King's Messenger was, however, able to proceed next day.

Switzerland.

Apparently, Germany, like a river damned, seeks an outlet elsewhere, because the Swiss Authorities are almost daily the recipients of offers from German companies of their machines and their pilots.

I have already reported the activities of two groups, one German and the other Swiss, relative to the establishment of passenger services. The crisis seems to be the lack of Swiss machines.

There is talk of constructing them in a State factory, but it is not probable that this will be done.

One private constructor is making some twin-engine machines to serve as passenger-carriers, whilst M. Georges Schule, a pilot, is constructing a single-engined biplane.

The Postal Authorities are studying the question of Aerial Posts, but the short distances to be covered, the frequency of fogs, and the relatively small quantity of mail, are arguments against its adoption.

However, in order that Swiss Aviation Industry shall not perish, and in order to rekindle the waning interest of the public in this form of transport, the Authorities have sanctioned a rather extraordinary procedure. Military aeroplanes are allowed to take civilian passengers. All flights commence at Dubendorf. The minimum rate is 50 fcs. for a quarter of an hour's flight, but if over 12 kilometres it is 75 fcs., and the same sum is charged for flying over the region situated south of the line Rohrschach-St. Gall - Jonschwil - Wattwil - Uznach - Einsiedeln - Lucerne - Napi-Thoune-Guggisberg-Bulle-Dent de Jaman-Rex-Monthet.

Each landing made at the request of the passenger will cost him 25 to 100 fcs., and a supplement of 5 fcs. for each quarter of an hour the machine is kept waiting. A flight from Dubendorf to Lucerne, without any intermediate stops, will be 300 fcs. From Thoune-Jungfrau and return is 500 fcs., whilst the flight Lausanne-Avenches-Neuchatel costs 150 fcs. single.

The Authorities are taking no undue risks. Payment must be made in advance and should the passenger wish to take a camera or cinema-camera with him he must pay another 50 fcs. for each quarter of an hour. Minors must, in the absence of their parents, have a certificate showing their parents' consent to the flight.

In general, all persons under 18 or over 60, or who suffer from heart trouble, anæmia, epilepsy, and other nervous maladies are not to be allowed the privilege of flying.

Aircraft at Harrod's.

Reference was made in The Aeroplane some weeks ago to the sporting model two-seater which was to be put on the market by the Blackburn Aeroplane and Motor Co., Ltd., at a price of £450. The first machine of this type is now on view at Harrod's showrooms in Brompton Road.

The machine is a side by side two-seater monoplane, 27 ft. 3 ins. span and 20 ft. 6 ins. long overall, and is fitted with a 45-h.p. two-cylinder "Gnat" A.B.C. engine. The fuselage is of triangular section, built of spruce with diagonal spruce bracings forming a lattice girder of each of the three sides. The fuselage is very deep beneath the cockpit, and the lift wires for the planes are attached directly to the bottom of the fuselage. To the same member, and at the same place, the axles for the landing wheels are hinged.

Above the fuselage a fairing is built up, forming a shield for the crew. The landing wires for the wings are attached at the top of this fairing to a specially constructed member, which also serves as a dashboard.

At the rear end of the fuselage a balanced elevator and a balanced rudder are fitted. Both these tail organs are built on steel tube spars, with spruce and three-ply ribs, and steel tube edging.

The chassis is of the "V" type, attached to the two upper fuselage longerons beneath the planes. The forward member of the "V" consists of two steel tubes, one behind the other, both enclosed in a single fairing of veneer. The hinged axle is slung between these two by rubber cords. The after member of the "V" is a single tube.

The wings are built on spruce boxspars, with spruce drift struts and spruce and three-ply ribs. Leading and trailing edges are of flattened steel tube. All the wing bracing, both external and internal, is of cable.

Lateral control is secured by ailerons, which are positively pulled down only—balanced by elastic springs.

A petrol tank with a capacity of 14 gallons, estimated to be sufficient for four hours' flight, is carried beneath the seats.

Petrol is pressure-fed to the carburetter, a windmill pump and a hand-pump supplying the necessary air pressure.

The cockpit is very roomy and should be comfortable and fairly free from draught.

With full tanks, crew of two, and 55 lbs. of luggage, the machine is said to weigh about 850 lbs.

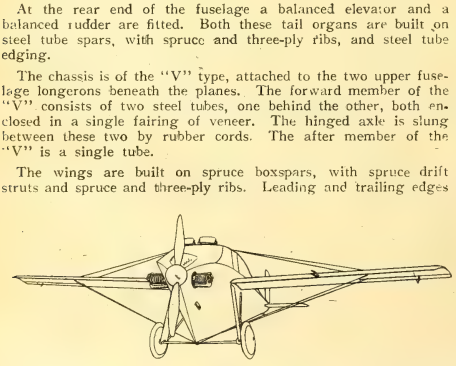
The makers hope that the machine will reach a top speed of 83 m.p.h., and will have a landing speed of 48 m.p.h. with this load.

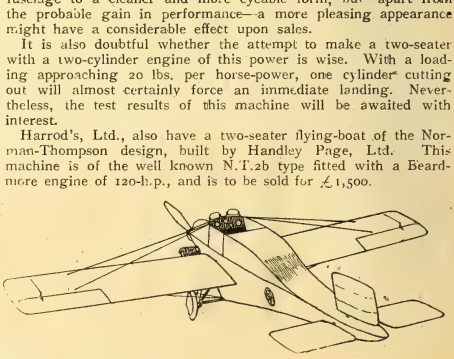
Very great attention appears to have been paid in this design to producing a machine as simple and as cheap to construct as is possible. It may be questioned whether this effort has not been carried too far.

It would perhaps be a little more costly to have faired off the fuselage to a cleaner and more eyeable form, but—apart from the probable gain in performance—a more pleasing appearance might have a considerable effect upon sales.

It is also doubtful whether the attempt to make a two-seater with a two-cylinder engine of this power is wise. With a loading approaching 20 lbs. per horse-power, one cylinder cutting out will almost certainly force an immediate landing. Nevertheless, the test results of this machine will be awaited with interest.

Harrod's, Ltd., also have a two-seater flying-boat of the Norman-Thompson design, built by Handley Page, Ltd. This machine is of the well known N.T.2b type fitted with a Beardmore engine of 120-h.p., and is to be sold for £1,500.





Two Drawings of the £450 Blackburn Monoplane (45 h.p. A.B.C.)

The "All British" pioneers of the aircraft propeller industry.

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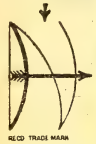
Our long experience enables us to ensure the most effective blending of theoretical and practical consideration. The combination of effective design, with the high quality arrived at and rigid inspection throughout manufacture, has resulted in by far the largest output during the war. Your enquiries for design or production will be in the most capable hands if placed with us. Please mention Dept. A.

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AERO ENGINES.

100	90 h.p. Curtiss Engines.		New.
20	80 h.p. Le Rhone Engines.		New.
100	"	" "	Repaired and ready for use.
100	80 h.p. Renault Engines.		New.
100	"	" "	Repaired and ready for use.
40	160 h.p. Sunbeam. Amazon.		New.
100	275 h.p. Rolls-Royce.		Various conditions.

Engines will be sold singly or in small lots to suit Purchaser.

AERO Wheels.

New Aero wheels complete with Tyres and Tubes. Various sizes passed by A.I.D.

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645	yds.	Black Shock Absorber Cord.	3/8
290	"	" " " "	7/16
3000	"	" " " "	1/2
898	"	" " " "	5/8
537	"	White " " "	5/8

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Tenders must be received not later than April 19th, 1919.

AIRCRAFT FINANCE

THE GREAT INSURANCE AWAKENING.

The Aircraft Industry ought to feel very flattered by the present activity in the insurance world. There is to be rivalry in the competition for aviation risks. Over thirty of the big offices, being seriously perturbed by the plan elaborated by Lloyd's underwriters, together with the Eagle, Star, and British Dominions and the Excess Insurance Companies are now inaugurating a scheme for the acceptance of risks associated with aeronautics.

A Hopeful Confession.

Frankly, this is an admission on the part of the Tariff Offices that aviation has great commercial possibilities, and consequently the insurance world as a whole must prepare to assist in the realisation of such possibilities for the benefit of the commerce of the country and their own individual profit in particular.

The necessity for the provision of adequate insurance facilities has been emphasised in these pages more than once within recent weeks. The difficulties have now been almost entirely removed, and one should be able in a very short time to cover any risks associated with commercial aviation with almost the same ease as one purchases a theatre ticket: it is coming to that.

No Monopoly.

The awakening, on the part of the insurance companies generally, as distinct from the Aviation Insurance Association of Lloyd's, has been somewhat abrupt: they have, no doubt, rubbed their eyes and shivered at the prospects of what they stood to lose if they had allowed the pioneers associated with Lloyd's to create a monopoly of the business which would necessitate a fight in the not distant future.

The Disadvantages of Pioneering.

However, to the pioneering instincts of those sponsors of aviation connected with Lloyd's and the two offices that joined together for the creation of the Aviation Insurance Association must the credit for the present auspicious development be bestowed.

They were prepared to work alone, without even that dole from the Government which was suggested a week ago, for the furtherance of aviation projects by providing the essential benefits of insurance facilities. Doubtless they stand to gain in the long run, but pioneering work is invariably costly, and involves hardship and exceptional risk.

The Pioneer Spade-Work.

In all probability the Aviation Insurance Association will still be obliged to do most of the pioneer or spade-work necessary for the completion of an efficient and standardised scheme of aviation insurance. Being a specialist in the business, it will doubtless prove more considerate, and will progress more determinedly than the combination of other offices with which aviation is only to be a side-line, designed for the purpose of attracting other classes of business.

It is useless to expect the two separate entities to work in close association or to harmonise their businesses. Such a combination would be in the true interests of aviation, because the division of expense incidental to experimentation and the elaboration of a perfect scheme would mean so much.

Healthy Competition to be Welcomed.

On the other hand, the absence of co-operation or mutual understanding means competition, and healthy competition will accomplish a great deal that could otherwise not be expected to happen. Regarded from that standpoint, the advent of the new scheme is to be welcomed with enthusiasm.

But it must be healthy competition, not a cut-throat struggle simply for show purposes with premiums down to zero; that would react disadvantageously on the industry when the time came to recoup losses from fundamentally unsound business.

The Security of Combination.

By the way, while the offices associated in the new plan will act independently, and each will issue its own policies, the assured will have, in addition to the security of the individual office concerned, the combined security of all the companies participating.

In the case of the Aviation Insurance Association it must be understood quite clearly that about two hundred and fifty members of Lloyd's are participants, and that in respect of each policy issued the liability is accepted as to 65 per cent. by these members of Lloyd's, as to 25 per cent. by the Eagle, Star, and British Dominions Insurance Company, and as to 10 per cent. by the Excess Insurance Company.

Third Party Risks.

In an interesting discussion of the legal problems of commercial aviation by Lieut.-Col. T. W. C. Carthew, D.S.O., R.A.F., it was remarked that unless the question of aerial trespass be approached in a broad-minded way infinite harm might be done to an epoch-making industry. Supposing an aeroplane came down in Piccadilly and killed someone, how would it be possible to prove fault or negligence with the pilot's head on the pavement of Piccadilly and his legs in Ludgate Hill?

A Novel Suggestion?

Is there to be right of action for trespass against every aeroplane that crosses a person's property? Industrial aviation companies, he remarked, could not generally be their own insurers, and, if Third Party Risks are too heavy, Lloyd's cannot undertake them. A practical solution of this difficulty might be found by charging 6d or 1s. a flight, and thus forming an Indemnity Fund under the control of the Civil Air Ministry, which could meet liabilities above a certain amount. By limiting the loss on one particular machine, aviation could be assisted as a commercial proposition.

Present-Day Premiums.

This suggestion is interesting, but, though the charge specified may seem trivial, it would be equal to a very considerable premium when compared with that now being charged to cover such risks.

CURRENT TOPICS.

New Capital Issue Regulations.

What the Financial World needs is a tonic and a respite from labour trouble. Things would probably be vastly improved thereby, and there would be less of that nervous suspicion which now keeps business near zero. The appointment of the Committee to regulate with more enlightened views the issue of new capital and the reorganisations of capital during the reconstruction period is a hopeful sign.

Vickers-Petters Big Deal.

Petters, Ltd., of Yeovil, formerly concerned with gas and oil engines, have concentrated their energy on aircraft during the

war. Large and important extensions have been carried out with that object, including the Westland Aircraft Works. Now a deal with Vickers has been completed for the formation of an auxiliary to develop the business of the Petter Semi-Diesel Oil Engines.

This will be called Vickers-Petters, Ltd., the capital being £500,000, divided into 320,000 £1 ordinary, and 180,000 £1 6 per cent. cumulative preference shares, Petters and Vickers being the sole shareholders, the former receiving 159,000 ordinary and 55,000 preference shares. The manufacture of these crude oil engines, which have reached a stage of great perfection, is to be concentrated at works in Ipswich provided by Vickers, Petters transferring to them all patterns, designs, special tools, etc. The Yeovil business, including the Westland Aircraft Works, etc., remain a separate and independent unit as Petters, Ltd.

Considerable activity and strength has been shown by the shares of Dennis Bros. It originates in the rumour, recorded here some time ago, that Dennis Bros. and White and Poppe may amalgamate. The latter have been intimately concerned with aero-engines during the war. Possibly, it will be found that some scheme of "melon-cutting" has more to do with the present movement in the shares.

Dame Rumour is very busy just now in the Stock Exchange. The latest report is that Siemens Bros. and the English Electric Co., which, as mentioned last week, is largely concerned with flying-boats, are to join forces. It may be right: it is probably wrong. Aircraft Manufacturing shares show little movement nowadays, there are a fair number of transactions in the short-term Notes. Little interest is taken in Whitehead Aircraft shares.

Whitehead Aircraft Action.

The action of the Whitehead Aircraft (1917) Company against the Fulham Small Arms Company was mentioned to Mr. Justice Astbury on a motion for a receiver and manager. Mr. Russell, K.C. (for the plaintiff company), said this was a debenture action. Plaintiffs' predecessors in title, Whitehead Aircraft, Ltd., had agreed to sell their small arms business to the defendants, and in respect of that transaction a debenture had been given by defendants. There was a dispute as to how much of the purchase money was really due. The defendants had paid £20,000 into court, and he proposed to take an order to the effect that, the plaintiffs delivering up the debenture, the Court declared they were entitled to a first charge on the £20,000 for all moneys found due in respect of the purchase. Mr. Micklem, K.C., for defendants, said they had paid the money into court, and he did not see the necessity for an order. His Lordship thought an order was necessary, and he requested counsel to agree as to the terms of it.

Hispano-Suiza.

The French Ballot Co. announces a dividend of 30 francs, against 25 francs, and shows a net profit of 3,041,624 francs, compared with 2,517,233 francs. The sum of 1,350,000 francs is reserved for war taxes. It is remarked that the business benefitted considerably from the French and American Government orders for 1,000 Hispano-Suiza (200/300 horse power) engines. The company commenced the construction of this class of business towards the middle of 1917.

Shell and the Mexican Eagle.

It is now officially announced that the Shell Transport and Oil in conjunction with the Royal Dutch Petroleum Co. has secured a controlling interest in the Mexican Eagle Petroleum Co. through a purchase of shares held by Pearson and Son, Ltd. The acquisition will increase the oil production controlled by the Shell interests by fully 50 per cent.

Sunbeam Motor Car Shares.

The Sunbeam Motor Car Company announce that the 250,000 Bonus £1 Ordinary shares were allotted on the 1st inst. An interim dividend of 2½ per cent., free of tax, on the ordinary shares, including the newly-allotted shares, is also declared.

Petrol Supplies.

Speaking at the annual luncheon of the Commercial Motor Users' Association, Sir Marcus Samuel, Bart., who is intimately associated with the great Shell Combine, said the question of the supply of petrol to motorists and other users was of more interest to him than anything else they could speak of.

He had always been an optimist in regard to oil supplies for the country, and there was not the slightest danger of a failure of supplies, no matter how great the demand might be. The storage depots were so full that it was almost impossible to land additional charge. The supply to-day was in excess of the demand, and it was important to realise that in the opinion of those best able to judge—those who controlled most oil fuel and were large producers—that even if the U.S.A. supply stopped there was enough petrol from British sources to meet the demand.

Lower Prices.

In the matter of prices he quite believed there was a chance of immediate relief. The present prices of petrol were not the fault of the producers, but of the Government control. There were the shipping and insurance departments which considered they ought to make profits in addition to the tax of the Treasury. He thought the time had come for all Government control to cease. He wished he could bring home to the users of petrol how much the interests of the producers were in common with those of the users. It had been his ambition to supply this country with the best and cheapest motor spirit.

It was important that the excess profits tax should be removed, because it made it impossible for British companies to trade in other countries, and foreign competitors had the advantage through not having such a tax imposed upon them. Motorists must co-operate with the oil producers to get all Government restrictions removed to ensure cheaper supplies.

The pooling of the oil reserves of the great producing companies had undoubtedly tended towards cheapening the price, and immediately the restrictions ceased the horrible stuff they had been compelled to supply to the motor trade would be replaced by the better quality of motor spirit they were accustomed to use.

NEW COMPANIES.

Metal Airscrew Co., Ltd.—Private company. Registered April 2nd. Capital £50,000 in 35,000 7½ per cent. cumulative preference participating shares of £1 each, and 300,000 deferred ordinary shares of 1s. each. To acquire from H. Leitner, M.I.E.E., certain patents for a metal propeller for aeroplanes and airships, etc. First directors:—N. Chéreau, Crockford Park Road, Addlestone, Surrey, managing director of Air Navigation Co., Ltd. (of French nationality), G. H. Veitch, Hill Place, Crawley, Sussex, managing director of Anglo-Scottish Investment Trust, Ltd., and H. Leitner, 64, Redington Road, Hampstead, electrical engineer. Registered office:—38-9, Threadneedle Street, E.C.

Adams Bros. and Burnley, Ltd. Private company. Registered April 2nd. Capital, £10,000 in £1 shares. To acquire the business carried on as Adams Bros. and Co., and to carry on the business of manufacturers of and dealers in aeroplanes, balloons, aircraft, automobiles, cycles, etc. First directors—W. T. Adams, 44, Cautley Avenue, Clapham, S.W.4; R. G. Adams, 141, Elms Road, Clapham, S.W.4; A. C. Burnley, The Holt, Ashstead, Surrey, advertising agent, director of Maypole Co. (1899), Ltd. Registered Office, Donington House, Norfolk Street, W.C.

Bankruptcy.

Stevenson, Walter James, patentee, Charing Cross Hotel, W.C.—This debtor, who is the inventor of a chemical compound for use in the construction of aeroplane wings, attended at the London Bankruptcy Court, before Mr. Registrar Mellor, on Tuesday, for public examination. His statement of affairs showed liabilities £1,496 13s. 4d. and assets consisting of a patent, the value of which was unascertained, and a bad book debt of £861 17s. He had been engaged on the above-named invention since the outbreak of the war. He had patented it, but, owing to lack of capital, had been unable to manufacture the compound, an acetate cellulose, his failure being due to ill-health and to the expenses connected with his invention, which had compelled him to have recourse to professional moneylenders. With the exception of £160 for law costs, the unsecured indebtedness related to borrowed money. A proposal had been brought in for the payment to the unsecured creditors of a composition of 10s. in the £.

The examination was concluded.

American Acceleration.

Few matters connected with Aeronautics have attracted so much attention during the last few months as the immense progress which has been made by our American friends in the direction of improving the performance of their indigenous Aircraft.

This improvement has been so great that many doubts have been expressed on this side of the Atlantic as to their actuality.

One is therefore glad to have this opportunity of indicating one of the methods employed by our rivals in arriving at the astonishing results of which so much has been heard.

In a description of the "Christmas" Bullet published in the "Aerial Age," of New York, this interesting little machine—fully loaded—was stated to have achieved a speed of 170 m.p.h. when driven by a Liberty "umpteen" and a ceiling of 14,700 feet.

A week or so later the same periodical announced that 14,700 feet was not the ceiling, but the height to which the machine would ascend without any fall in its climbing rate, and that the absolute ceiling was nearer 34,700 feet. This by way of a start. In the same journal, of March 3rd, the following appear:—

I. Page 1193A.—Advertisement by the manufacturers.—"Speed over 180 miles per hour."

II. Page 1233.—News page.—Photograph inscribed: "Makes a speed of 170 miles per hour."

III. Page 1238.—News page.—Photograph inscribed: "Has attained a speed of 175 miles per hour."

IV. Page 1271.—Advertisement by maker of varnish used on the machine.—"A speed of 197 m.p.h. was made by this plane."

Obviously item I was displaced in the "make up" of this issue—the advertisement from which it is taken should have followed the reading matter instead of preceding it.

But the amelioration of the machine's performance from a speed of 170 m.p.h. and a ceiling of 14,700 feet to a speed of 197 m.p.h. and a ceiling of 34,700 feet is here exhibited in all its native beauty.

"It's so simple."————————

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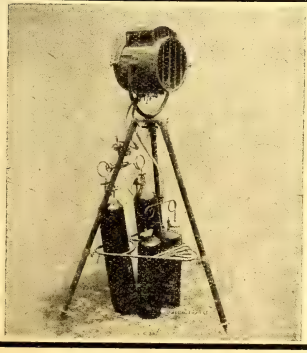
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AIRCRAFT IN PARLIAMENT

The following oral answers were given on March 31st:—

AIR SERVICE.—STORE DEFICIENCIES.

Mr. RAPER asked the Under Secretary of State to the Air Ministry how much has been written off as a charge against the public for stores deficiencies of squadrons stationed in Great Britain since the war began; and what percentage of this amount has been recovered from the officers responsible for such deficiencies?

Mr PRATT (Lord of the Treasury): These squadrons served with the Navy or Army until April, 1918, when they were transferred to the Air Force, and the value of the stores written off could only be ascertained by much labour on the part of the local and headquarter staffs of the three forces. The results of the inquiry would be misleading, since the write-off did not always represent actual deficiencies, but sometimes represented discrepencies due to defective accounting during war pressure. The money recovered from officers responsible bears no direct ratio to the value of the stores deficient.

AERODROME ACCOUNTS (PUBLIC AUDITOR).

Mr. RAPER asked the Under Secretary of State to the Air Ministry what were the exact reasons given by a public auditor for resigning at the end of last year from his position as voluntary auditor of aerodrome accounts?

Mr. PRATT: The specific grounds stated were: (1) That no attempt was made to provide the auditors in question with necessary staff; (2) that the highest salary paid in the Department responsible for passing bills was £250, and very few of the staff had any knowledge of the work prior to engagement; and (3) that several members of the staff were highly dissatisfied as to their future, and it was a matter of extreme urgency that something should be done in that respect. Various matters were referred to in general terms, but these were the only specific reasons given.

Sir E. CARSON: Were these reasons true reasons?

Mr. PRATT: Oh, no, Sir, I could not answer that question.

AIR MINISTRY ORGANISATION.

Mr. RAPER asked the Under Secretary of State to the Air Ministry if he will appoint a small but permanent Committee, composed of two or three hon. Members of this House and two or three gentlemen outside the House who have a knowledge of commercial organisation, to assist the Air Ministry authorities in finance and business matters generally?

Mr PRATT: My hon. friend's suggestion is noted and will be borne in mind as the organisation of the Air Ministry develops. The principle underlying it has already been accepted by the approval of a Standing Committee with outside representation to watch the working of the orders regarding civil aviation shortly to be issued under the Air Navigation Acts.

Mr. RAPER: Can the hon. gentleman say who are the members of the Committee?

Mr PRATT: Perhaps my hon. friend will put that question down on the paper.

DIRECTOR OF PRODUCTION AND RESEARCH.

Mr. RAPER asked the Under Secretary of State to the Air Ministry what are the duties of the Director of Production and Research; and is this officer under General Sykes or General Trenchard?

Mr PRATT: My hon. friend no doubt refers to the Director-General of Supply and Research. General Ellington is a member of the Air Council of equal status with Generals Trenchard and Sykes. His duties are to control the Departments of Supply, Inspection, and Research in the Air Ministry.

Mr. RAPER: Has General Ellington had any business or scientific experience qualifying him for the position?

Mr. SPEAKER: The hon. Member had better give notice of that question.

AIR STATIONS.

Sir ARTHUR FELL asked the Under Secretary of State to the Air Ministry how many of the existing Air stations have been closed down since the Armistice; and how many stations it is proposed to maintain permanently after the peace is signed?

Mr. PRATT: It is estimated that 40 stations will be required permanently for Royal Air Force purposes. When the Armistice was concluded the policy adopted was to abandon landing grounds and stop work on stations under construction wherever possible. Work has been stopped on 128 stations. In arriving at this future account has been taken of requirements for temporary storage and for civil aviation as well as of permanent Royal Air Force requirements.

ATLANTIC (SUGGESTED FLIGHT).

Sir ARTHUR FELL asked the Under Secretary of State to the Air Ministry if the Government is taking any part in the preparations for the suggested flight of aeroplanes across the Atlantic; and, if so, what limit is put on the expenses to be incurred on this account?

Mr. PRATT: The various problems connected with the Atlantic flight have received and are receiving the close attention of the Air Ministry in consultation with private persons and companies interested. The question of direct Government participation has not been finally settled.

Sir ARTHUR FELL: Is any sum to be devoted to this attempted Atlantic flight?

Mr. PRATT: Perhaps the hon. Member will give notice of that question.

DEMOBILISATION.

Sir ARTHUR FELL asked the Under Secretary of State to the Air Ministry what is the present position of the demobilisation of the Air Force, and if it is being carried out as rapidly as that of the Army?

Mr. PRATT: Up to the 26th of this month, 8,544 officers and 169,122 other ranks had been dispersed from the Royal Air Force. The answer to the second part of the question is in the affirmative.

The Naval, Military, and Air Service Bill passed the Third Reading on March 31st.

* * *

The following oral answer was given on April 1st:—

AIR MINISTRY (CONTRACTS).

Mr RAPER asked if the Break Clause has been imposed in the case of all contracts which were in force when the Armistice was signed for the supply of aeroplanes, engines, and spare parts; and whether in any case the imposition of this Break Clause has been subsequently varied?

Mr HOPE: The Break Clause has been imposed on all contracts for aeroplanes, seaplanes, engines, and spare parts, in force at the date of the Armistice, with the exception of contracts for certain of the latest types of machines and engines, which the Ministry of Munitions was requested by the Air Ministry to complete, and of contracts for obsolete types where it has been thought preferable to stop work rather than to incur expenditure during the Break period. The quantities to be delivered under the Break Clause have, in many cases, been varied, after investigation of the work in progress, in order to secure the greatest economy, having regard to the expenditure already incurred, and the value of the articles when completed.

Mr. RAPER: Will the hon. gentleman give particulars of the contracts which have been varied?

Mr. HOPE: I think that would be too long. Perhaps my hon. friend will communicate with me on that matter.

Mr. RAPER asked why the system which was adopted of allowing contractors a certain profit on materials supplied to them by the Government was made retrospective?

Mr. HOPE: From the form of the question it is not possible to identify the system to which my hon. friend refers. If he will supply me with further particulars I will have inquiries made.

* * *

The following oral answer was given on April 2nd:—

DEMOBILISATION.—ROYAL AIR FORCE.

Major HENDERSON asked the Secretary of State for War whether he is aware that men of the Royal Air Force are being offered early demobilisation provided they accept a scheme of deferred payment; if he will state when this scheme was introduced; and whether he is aware that this system lays itself open to the argument that a man must accept the scheme, whether he likes it or not, unless he wishes his demobilisation to be delayed?

The SECRETARY OF STATE FOR WAR (Mr. Churchill): I am aware of this scheme referred to by my hon. and gallant friend. It was introduced about the end of January last solely with the object of suiting the convenience of men who were in a hurry to take up jobs in civil life. It has the effect of enabling men who voluntarily adopt it to be demobilised more speedily than would otherwise be possible. No man who refuses to accept the scheme loses his turn for ordinary demobilisation, which goes on continuously at a fixed rate. I may add that the adoption of the scheme reduces the expenditure incurred. From every point of view the scheme is much to be commended.

* * *

The following written answer was given on April 2nd:—

CIVIL AVIATION (STANDING COMMITTEE).

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry if he will state the names and qualifications of the Standing Committee which has been appointed to watch the working of orders regarding civil aviation?

Major-Gen. SEELY: The Committee has been approved as stated in a reply to the hon. Member for East Islington on the 31st ultimo. Its constitution is under consideration.

* * *

The following oral answers were given on April 3rd:—

AIRCRAFT CONVEYANCE OF LETTERS.

Mr. GILBERT asked the Postmaster-General if any licence or permit has been given to any private aircraft company to convey letters from this country to France; and, if so, if he can state the name of the firm and the conditions on which they have been granted?

Mr. ILLINGWORTH: The answer is in the negative.

AIR MINISTRY.—LINEN (PURCHASES).

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry for the names of the firms of contractors from whom linen was purchased during the War; the price per yard at which it was purchased; and what arrangements are being made for its disposal?

THE DEPUTY-MINISTER FOR MUNITIONS (Mr. Kellaway): I have been asked to answer this question. Linen was purchased from 137 contractors, whose names I shall be glad to send to my hon. and gallant friend if he should desire me to do so. The price per yard varied with the price of flax. At the time of the Armistice the price ranged from 1s. 8d. for spaced fabric to 3s. 0½d. for solid fabrics. A considerable quantity of linen is being disposed of in this country in small lots by public tender after advertisement, and arrangements are being made for meeting the demands in foreign markets.

Mr. MacVEAGH: How many millions of yards of linen are now being treated as scrapped by the authorities?

Mr. KELLAWAY: None of it is being treated as scrapped.

Mr. MacVEAGH: How many millions of yards were over-ordered?

Mr. KELLAWAY: The probable surplus is something like forty million yards.

Lieut.-Col. MALONE: And what price is being obtained for it?

Mr. KELLAWAY: I cannot give the figures off-hand, but the contractors offered a shilling a yard.

COMMERCIAL ORGANISATION COMMITTEE.

Mr. RAPER asked the Under Secretary of State to the Air Ministry when he will give a definite reply as to whether or not he will appoint a small but permanent Committee, composed of two or three hon. Members of this House and two or three gentlemen outside the House who have a knowledge of commercial organisation, to assist the Air Ministry authorities in finance and business matters generally; and whether such a Committee is specially desirable during the present reorganisation of the Air Ministry and in view of the admitted defective accounting in the past?

Mr. CHURCHILL: I refer my hon. friend to the answer given to him on the 31st ultimo.

Mr. RAPER: Are we to understand that the Committee does actually exist? Can we have the names of the members?

Mr. CHURCHILL: No, Sir, that is not to be deduced from my answer. But there are the most competent men who are associated in an important way with the work of the Air Ministry.

Lieut.-Col. MALONE: Can their names be supplied?

Mr. CHURCHILL: They are men from the Army Council who are associated with the Air Ministry in an advisory capacity.

Mr. RAPER: Will the right hon. gentleman consider the desirability of appointing a committee such as I have suggested?

Mr. CHURCHILL: I will, indeed.

HENDON AERODROME.

Mr. RAPER asked the Under Secretary of State to the Air Ministry if he is aware that about twenty Handley Page machines, some with engines and some without, have been left uncovered in the wet at Hendon for periods varying from one to three months, all through the recent bad weather, with the result that practically all of them are only now fit to be written off; whether the reason put forward for their being there is that there was no accommodation to house them; is he aware that the Kite Balloon Department offered to lend the Aeroplane Department portable sheds, originally built for the housing of kite balloons, but which would have accommodated the Handley Page machines quite comfortably, with their wings folded, and is he

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aware that these Handley Page machines cost the country something like £20,000, that they are still standing out in the open, rotting, and that the said kite balloon sheds are all carefully stored away in their folded-up condition, being eaten by rats?

Mr. PRATT (Lord of the Treasury): The aeroplanes in question are constructed to withstand exposure without permanent damage, and none of the Handley Pages at Hendon have rotted in any way. Of the number stored there temporarily to await accommodation becoming available, the majority have now either flown away or are stored under cover at Hendon. Eight machines still remain in the open, and will be flown away as soon as circumstances permit.

The proposal to erect kite balloon sheds would have evolved an amount of labour not justified by the requirements of the case.

Mr. RAPER: May I take it that every one of these machines is in perfect order?

Mr. PRATT: I am sorry that I cannot add anything to the answer I have already given my hon. friend.

CIVIL AVIATION.

Mr. JOYNSON-HICKS asked the Under Secretary of State to the Air Ministry whether he can now make a statement as to the staff and work of the Controller of Civil Aviation?

THE SECRETARY OF STATE FOR WAR (Mr. Churchill): The Controller-General of Civil Aviation is the member of the Air Council responsible for the executive work falling to the Air Ministry under the Air Navigation Acts, 1911-1919, and for carrying out the accepted policy of assisting the development of civil aviation. It is proposed that he shall be assisted by four heads of Departments who will take charge of planning, information, communications, and aerodromes, respectively. Provision will also be made for meteorological services. Terms for the heads of Departments have been approved, appointment of staff is proceeding, and the Department is being formally constituted as from April 1st, being the beginning of the financial year.

Mr. JOYNSON-HICKS: I do not want to press the right hon. gentleman unduly, but perhaps he could mention a date when he will be able to make a full statement as to the appointment of the staff and the allocation of the work?

Mr. CHURCHILL: I think that in the next few days I can mention the principal office holders, but I really think it would be a pity to hurry the selection of the filling of the positions of second rank.

Mr. JOYNSON-HICKS asked the Under Secretary of State to the Air Ministry whether he can give an assurance that the Royal Air Force is not in any way to be brought under the control of the War Office and that civil aviation will not in any way be placed under the control of the Minister of Ways and Communications?

Mr. CHURCHILL: There is no intention of bringing the Royal Air Force under the control of the War Office or of placing civil aviation under the control of the Miinstry of Ways and Communications. Cabinet decisions in this sense have been definitely obtained.

DIRECTOR-GENERAL OF SUPPLY AND RESEARCH.

Mr. RAPER asked the Under Secretary of State to the Air Ministry where the Director-General of Supply and Research acquired the necessary business and technical experience to qualify him for the post?

Mr. CHURCHILL: The Director-General of Supply and Research is an officer who rendered brilliant war service in the Army and in the Air Force, and was for a considerable period Controller-General of Equipment in the Air Ministry. I am satisfied that he is well qualified for the appointment which he holds.

AERODROME CONSTRUCTION.—(CONTRACTORS' PROFITS.)

Mr RAPER asked the Under Secretary of State to the Air Ministry why the system which was adopted of allowing contractors for the construction of aerodromes a certain profit on materials supplied to them by the Government was made retrospective?

Mr. PRATT: Under the original War Office contracts for aerodrome construction the contractors did not receive commission on materials supplied by the Government, but at that time the actual control of materials by Government was small. When the Air Ministry took over the contracts the situation in regard to Government control of materials had entirely altered, and in order to expedite progress on the aerodromes modifications in the contracts were made, and it was decided that it would be fair as part of these arrangements to allow a commission on all materials actually handled by the contractors as from the date of the original contract.

Mr. RAPER: Is it not the fact that this is being made retrospective and applied to contracts already completed?

MISS VIOLET DOUGLAS-PENNANT.

Lieut.-Col. MALONE asked the Secretary of State for War whether a *prima facie* charge has now been received on behalf of Miss Violet Douglas-Pennant; and whether he will now carry out his pledges given on March 13th to constitute a full inquiry into the circumstances surrounding her case?

Mr. CHURCHILL: The answer to the first question is in the negative. The second question accordingly does not arise.

Lieut.-Col. MALONE: Is it the fact that no communication has been received?

Mr. CHURCHILL: No, Sir. Communications have been received but they do not fulfil the condition which I made in the House and of which the House generally approved.

PUBLIC AUDITOR (RETIREMENT).

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry whether he is prepared to make any further statement as to the grounds for retirement of the public auditor; and if he will say what steps have been taken to deal with the situation created by his retirement?

Mr. CHURCHILL: As at present advised, I have nothing to add to the answer given to the hon. Member for Islington East on the 31st ultimo.

The following written answer was given on April 3rd:—

AIR MINISTRY (STAFF).

Viscount WOLMER asked the Under Secretary of State to the Air Ministry whether he is aware that several disabled and demobilised officers who have been employed in the Air Ministry have recently had their services dispensed with, while women are being retained in the Air Ministry at exactly the same work as these officers performed; and whether it is the intention of the Ministry to give preference to civilians over officers who have become disabled during the War?

Major-Gen. SEELY: I am aware that a number of disabled officers who have been employed in the Air Ministry have recently had their services dispensed with, but women are not being retained in the Air Ministry on exactly the same work as these officers performed. It is not the intention of the Ministry to give preference to civilians over officers who have become disabled through the War, though in filling up the establishment of the Ministry the principles laid down for the Civil Service as a whole must be maintained.

More Grievances of Cadets.

To the Editor of THE AEROPLANE.

Sir,—Re your report and comment on the benefits to be conferred on the Colonial Flight Cadets, insomuch as they are to be granted Temporary Commissions, together with the £50 kit allowance.

I am writing to you as an Englishman only, but I should like to protest (if an Englishman is considered to have the right to protest in this matter) against the injustice of this arrangement to Overseas English Flight Cadets.

I enlisted in 1914, and have spent 14 months in the Infantry in France. I was admitted to the R.F.C. as a Cadet in Feb., 1918, and since June, 1918, have been in training as a pilot at various aerodromes. I have done about 60 hours' flying, but owing to bad luck, time wasted through having to change aerodromes, and the easy going system of my last instructor, I was not able to graduate "B."

Were I a Canadian, I should benefit by the above arrangement. Had I been a South African, I should have been gazetted when I passed the Course at the School of Aeronautics (June, 1918). But, no, an Englishman is, apparently, either not worth this consideration, or it is thought that he will take anything lying down. The South Africans made their Government take action for them, and the Canadians have evidently done the same, but who will speak for the Englishman? He has not yet entered the limited vision of the politicians.

I am not an isolated case, Sir; thousands have been demobilised; we think that although the Colonials, Serbians, Belgians and Americans may have won the war—we helped!

"M. M."

Sir,—In recent issues of THE AEROPLANE I have noticed a space allotted to "Cadets' Grievances," and I am wondering if this grievance, which is a common one on this particular aerodrome amongst Flight Cadets, could find its way into your paper at an early date.

After making numerous applications to get some definite understanding as to what eventually is to become of Flight Cadets, who are, in Army parlance, "Time-serving," completed their training, categoried as "Service Pilots, wearing wings, etc., we have met with absolutely no success at all. The idea of obtaining a commission (other than honorary without pay, gratuity or allowances) is a thing remote.

The hopes of being demobilised are the same, irrespective of the fact that quite a number of us were students before the war, and who were neither "Derby" nor "Military Service Act" men, but 1914 men, who have sacrificed nearly five years of valuable time to the "cause," and all whom have been service overseas.

It was no fault of ours that we were not commissioned on leaving the School of Aeronautics in 1918, not one of us had to take a "course" again, the first one finishing a few days after the R.A.F. came into existence, neither were we informed that we should have to go through a ground gunnery school and graduate "A" as it was in those days, before receiving the elusive "pip." We were then and ever since have been kept going hard at it with very vague promises, while the R.N.A.S. cadets or P.F.Os. were automatically made Sec. Lieuts. The R.F.C. cadets got nothing, only the pleasure of being told some time later by a certain Gunnery official that they were "less than a blur upon the horizon until they justified their existence"; and being merely cadets, wearing the white band of a blameless life, had to take gross injustices of everything that concerned them sitting down, because if one attempted to stand up, the ever-menacing sword of Damocles in the form of "R.T.U." would surely and swiftly fall.

What we wish that Air Ministry would do is to grant the usual temporary commission to Flight Cadets who have graduated "B" with the usual £50 kit allowance and the first year's gratuity, and to cadets "A" commission with kit allowance, and a smaller gratuity, and to the cadets in the S.M.As., etc, honorary commissions and enough kit allowance to cover their own expenses, which, we think, is the least the Air Ministry could do, and let us get back to civilian life with thoughts of the fact that our labours have not been in vain.

"PLEBEIAN."

Clearing the Seas.

The "Naval Experts" of the "Daily Express" have suggested in that paper that airships should be used for mine-sweeping in the North Sea. While advocating the use of airships on this work, the experts agree that difficulty would be found in the method of attaching the hawser for sweeping, owing presumably to the weight thereof. The experts claim, as the great advantage of this method, that the airship could never be harmed by the explosion of a mine beneath her. The idea somehow appears to be based on several fallacies.

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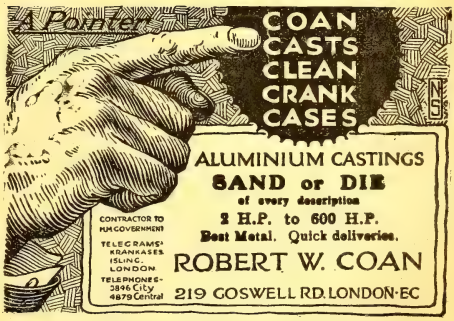
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NOTES ON PARACHUTES AND PARACHUTE FLARES.

By Lieut.-Col. H. S. HOLT.

I.

THE SINGLE PARACHUTE SYSTEM.

Parachute designing is not yet an exact science and more data will be required before this stage is reached. The following notes pretend to no exact scientific accuracy, they are merely rough data and conclusions resulting from 5 or 6 years' experiments with parachutes.

Most of the experimental work has been carried out in connection with the writer's own special parachute system, but the data obtained as to strength of fabrics and what he terms the "imperence" (resistance to the passage of air through the meshes), and so on, apply to all parachute construction. The parachute has received a great deal of attention lately owing to the demand for a reliable life-saving device to enable an aviator to escape from a damaged aeroplane or airship.

Quite early in the war the writer schemed out a device of this kind for use on aeroplanes, but the idea of such a device was not smiled on by the Authorities in those days, and having other more pressing work in hand, he put the subject on one side.

USE OF PARACHUTES BY GERMAN AVIATORS.

When, however, in the summer of 1918 it became known that German aviators were escaping from their machines by means of parachutes, the cry from the Allied aviators for some similar equipment became insistent.

Parachute Committees were assembled hastily by the Allies, and experiments were being rushed through when the Armistice intervened and gave pause to what might have been over-hasty decisions. A proportion of the different Allied Committees, or Sections, were officers who had done pioneer work as actual parachutists, but so far as the writer knows few had any practical knowledge of parachute construction.

Under the circumstances it is hardly to be wondered at if some of the experimental work merely afforded information that could have been got from any practical parachute maker, while, on the other hand, probably from lack of time, experiments were omitted which should have been made before decisions were taken.

THE SIX AXIOMS.

There are six axioms that may be predicated safely with regard to parachutes:—

1. The better the design, or theoretic contour of a parachute, the better it will maintain this contour when dropping under load. The worst form of parachute is that which opens to a saucer shape (Fig 1) and then assumes the shape of Fig. 2 as it begins to drop under load. It puts an unnecessary and severe strain on the fabric of the parachute, and, in the case of a life-saving parachute, it will give a maximum of shock to the passenger.

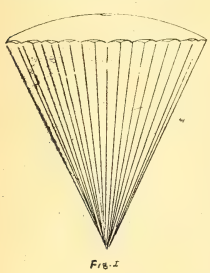


FIG. 1.

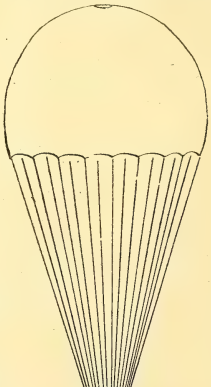


FIG. 2.

2. So long as a good "Air pocket" is maintained in the parachute, the fewer lines and bridles employed the better. The more lines the more chance of a tangle.

3. The better the design the less "bellying" or "panelling" there will be at the circumference.

4. A practical parachute should not require skilled labour to pack it, nor should the process take an undue amount of time. This does not apply to parachute flares which are necessarily packed in the factory; but it is of considerable importance in Life-Saving Parachute Systems. The writer believes some parachutes take as much as three hours to pack. Forty minutes should be ample time for this process, even with unskilled labour.

5. A good parachute is a compromise of various attributes or qualities.

6. The nature of this compromise depends on the nature of the work that the parachute is intended for.

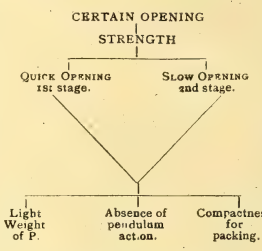
ATTRIBUTES OF A GOOD PARACHUTE.

It follows that the term "efficiency" when used in the ordinary loose way in connection with parachutes may have various different significations. Assuming that it gives the desired velocity of descent, the writer has endeavoured below to set out diagrammatically the various attributes of a good parachute, placed in order according to the degree of attention and care required to attain each quality.

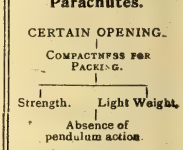
Thus in the Holt Pilot Parachute the writer places strength first and certain opening second. This does not mean that a strong parachute is any use if it does not open, but merely that owing to the small diameter of a pilot parachute it can be made to open with certainty without any special precautions, whereas great care must be taken to ensure it being strong enough for the maximum strain it may ever have.

SINGLE PARACHUTE SYSTEM.

Life-Saving Parachutes.

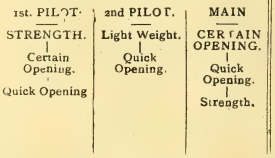


Bomb and Flare Parachutes.



HOLT COMPOUND PARACHUTE SYSTEM.

Life-saving Parachute



Bomb & Flare Parachute.



QUICKNESS IN OPENING.

One sometimes reads in a report on life-saving parachutes that a certain type was bad because it opened too slowly, and later on possibly in the same report that another was bad because it opened too quickly. This is due to the loose way in which the term "opening" is used. In large parachutes such as are used in life-saving, there are really two stages in the opening process.

The first stage is that when the air begins to get in between the adjoining surfaces and folds of the parachute and separate them. The quicker this happens after the parachute is withdrawn from its case the better. The second stage is when the parachute commences to expand to its full diameter. The slower this process takes place the better. If it expands too quickly it imparts a serious shock to the passenger at the instant of attaining its full diameter, and, besides, puts a very severe strain on the fabric and rigging.

LIFE-SAVING PARACHUTES.

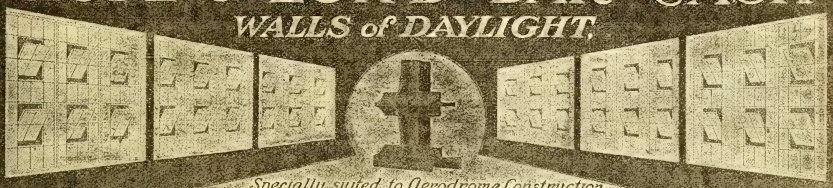
Of the life-saving, or, as they are usually called, "man-dropping" parachutes, there are two well-known British makes—the Spencer and Calthrop—which have done useful work from airships and observation balloons during the war, and the very ingenious Mears, also British, now just emerging from the experimental stage.

The best known foreign makes are the German of two or three different types, the French Aviation and Balloon Parachutes, and the "Robert."

It is not within the province of these notes to describe in detail any of these systems most of which are well known, but, speak

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ing generally, one may say that most types of life saving parachutes, except the "Robert," function on the same general principle, viz., that the withdrawal of the parachute from its case is brought about by the difference in degree or direction of motion as between the aircraft and the passenger.

Thus, when an observation balloon is set on fire the passengers jump overboard immediately while there is still enough gas to keep the balloon from falling, and the man falling away below the balloon pulls the parachute out of its case and it opens above him. Similarly, if the passenger jumps off a travelling airship or aeroplane his parachute will be drawn out by the resultant forces of the machine in a horizontal direction and the force of gravity acting on the passenger.

During the war there were numerous cases when the machine was set on fire by the enemy, and the passengers could have escaped while it was still on a level keel. If, however, a machine suddenly collapses through something giving way, or gets out of control and crashes to the ground, the conditions are entirely different.

Most parachute systems require a pull of some pounds to withdraw the parachute from its case. If when the passenger jumps overboard he falls at the same speed as the machine, or if the initial difference is so small as to be insufficient to overcome the resistance of the parachute in its case, the parachute will not be withdrawn at all, and passenger and machine will crash to the ground together.

A Sporting Chance of Escape.

If the man falls so much faster than the machine that the parachute is withdrawn the passenger may have a sporting chance of escape, provided that the parachute does not become entangled in the machine. If the machine were falling in a spinning dive, or rolling over, this would almost certainly happen, and it is difficult to believe that any man could possibly escape under those circumstances.

Again, suppose the machine is falling absolutely "end on," that is, with the body vertical, and faster than the passenger, the difference in speed being sufficient to withdraw the parachute, then it is almost a certainty that the parachute will become entangled in the tail.

If, however, the machine is falling with the body at a slight angle and there is a strong wind blowing in the right direction, it is possible the parachute may keep clear of the machine and also of the passenger; because it must be remembered that in every case when the machine is falling faster than the man the parachute will be withdrawn below the man.

If the machine is falling at an angle as before but the wind is in the wrong direction or not sufficiently strong to overcome the suction of the falling machine, the parachute will be drawn into and entangled in the machine.

If the machine is falling as before and there is no wind and no suction, the parachute will be withdrawn in a vertical line below the man and he will fall on to it and almost certainly get entangled in the lines. These are self-evident facts and no amount of ingenious theorising will get over them.

The Moral of the Pilot.

What is going to be the effect of this knowledge on the moral of a pilot? Knowing that with the parachute system he carries, his only real chance of escape lies in jumping overboard while the machine is still on an even keel, he will be tempted to leave the machine at the first hint of trouble, and when, if he had stuck to it, he would possibly have brought it safely to earth.

In peace conditions, there will be few cases of machines catching fire and giving the passengers a chance to escape while it is still on a level keel. Accidents will be mostly by machines suddenly crashing owing to some part giving way, or the machine getting out of control, and obviously no parachute system can be of much value, unless it can be relied on in these conditions.

The French "Robert" parachute functions on an entirely different principle. The parachute is carried in a sack on the back of the passenger and is operated by the passenger after he has jumped overboard, pulling a lanyard which releases springs which expel the parachute.

Provided the passenger has sufficient coolness and self-possession to do this while he is falling, this system should enable him to escape from a falling machine. So far as the writer knows it has only been tried on dummies, and in the early trials in France it was found to give a very severe shock as recorded by the dynamometer.

Apart from the principle on which they function, all "single" parachute systems such as those described above have serious drawbacks when used for life-saving. Owing to the uncertainty as to how far the passenger may drop before the parachute opens, an enormous factor of safety has to be allowed for in constructing the parachute. This means excessive cost and weight. Until recently all life-savers were made of very costly China silk, and had the war gone on there would not have been enough of this silk in the world to equip the Allied Air Forces with parachutes for all their machines.

When a Parachute Falls 600 Ft. before Opening.

A parachute should open in 40 to 80 feet, but instances are quite common where it has fallen 300 or 400 feet and occasionally much more before opening. It is easy to imagine the strain put on a parachute which falls 600 feet before opening, easier perhaps than to picture the feeling of the passenger falling at a terrific speed and doubting whether his parachute is going to open at all.

The problem is further complicated when the parachute is withdrawn from a machine travelling at 80 or 100 miles an hour. At first sight it would seem that then the strain on opening would be much greater than if it were used from a kite-balloon, but, in practice, it is found that this is not so, necessarily, although there has been at least one case in England where the parachute has burst on opening, when released from a machine travelling at 90 m.p.h.

A severe strain on the parachute fabric means a correspondingly severe shock to the passenger, and it has been found necessary to introduce shock absorbers on these single parachute systems. The problem is very complicated. Experiments made so far have given very conflicting, sometimes wholly irreconcilable results, even when the conditions were apparently the same.

Released from a Machine Travelling at 90 m.p.h.

For instance, a parachute loaded with 180 lbs. has been released from a machine travelling at 90 miles per hour. It has apparently functioned normally and opened in three seconds, yet the dynamometer registers a shock of 1,500 lbs., though in a similar trial made on the same day, and under the same conditions, the dynamometer then indicated 600 or 700 lbs. It is found in the single parachutes that the shock varies between 250 and 1,750 lbs. with a load of 180 lbs.

Again, in single parachute systems the parachute is drawn out from the circumference instead of from the centre. This tends to keep the mouth closed and to start suction through the centre hole, thereby keeping the inner surfaces of the fabric together and preventing ingress of air and consequent inflation. This may be aggravated if tapes instead of cords are used, as they may range themselves flatwise and effectually prevent air entering.

The Autochute.

In the next article the writer will describe his "Autochute," or life-saving appliance. This is constructed on what he terms the "Compound" or "Pilot" Parachute System. His claim for this is that (1) from a kite-balloon or from an airship or aeroplane travelling on a more or less level keel, it will give at least as good a chance of escape as any of the single parachute systems.

(2) It will give a fair sporting chance of escape, no matter what the airship or aeroplane is doing when the passenger leaves it.

(3) It will permit of realistic tests being made from machines flying at steep angles, which could not be attempted with the ordinary parachute systems.

(4) It will allow a man to make trial or practise descents with a minimum of risk.

(5) Various other qualities such as instances of uncertain and excessive shocks to the passenger and strains on the fabric; absence of suction and consequent certainty of opening.

These qualities are partly inherent to the nature of the "Pilot" parachute system, partly to the special construction the writer employs for his parachute.

"The Revelations of Roy."

To those who appreciate the humour of one Artemas, and who are not worried by anachronisms, one may recommend the little book which is frankly stated to be in the manner of Artemas, and is entitled "The Revelations of Roy." Roy was an Air Mechanic, R.F.C., and afterwards became a commissioned officer. He has a distinct humour of his own, and those who can read between the lines as well as comprehending what is directly in front of their noses will find that there really are some revelations concerning the inwardness of the Air Force in the book or, perhaps, one should call it the brochure in question.

It is sold at the moderate price of 1s., and can be obtained post free for 1s. 2d. from The Aeroplane and General Publishing Co., Ltd., Union Bank Chambers, 61, Carey Street, W.C.2.

A Flight from Lyons to Rome.

On April 6th, M. Roget, the French aviator, accompanied by a mechanic, left Lyons 9.16 a.m. for Rome. He arrived at Centocelle Aerodrome, near that city, at 4 o'clock the same afternoon, having covered a distance of approximately 500 miles.

NAVAL & MILITARY AERONAUTICS

FROM THE "LONDON GAZETTE."

AIR MINISTRY, April 1st.

R.A.F.—The following temp. appointments are made :—Staff Officer, 2nd Cl.—(T.) Capt. F. H. Tyas, and to be actg. Maj. while so empld., Jan 14th.

Staff Officers, 3rd Cl.—(Q.) Capt. A. Warnock, Oct. 18th, 1918.

Flying Branch.—Capt. C. H. Elliott-Smith to be actg. Maj. while empld. as Maj (A.), Sept., 12th, 1918.

Lt. G. S. O'Brien (Can. Cyc Corps) to be actg. Capt. while empld. as Capt. (A.), Oct. 1st, 1918.

Lt. (Hon. Capt.) S. J. Read to be actg. Capt while empld. as Capt. (A. and S.), July 1st, 1918.

Sec. Lt. C. Turner to be actg. Capt. while empld. as Capt. (A. and S.), Nov. 1st, 1918.

V. L. Watts (temp. Sec. Lt., Essex R.) is granted a temp. commn. as Sec. Lt. (A.), Sept. 8th, 1918.

Cadet 137533 W. V. Leftley is granted a temp. commn. as Sec. Lt. (Observer Officer), Oct. 3rd, 1918.

F. L. Barlow (Lt., Quebec R., C.E.F.) is granted a temp. commn. as Sec. Lt. (Observer Officer), Nov. 9th, 1918, and to be Hon. Lt.

The following relinquish their commns. on ceasing to be empld. :—Sec. Lt. (Hon. Lt.) G. F Davies (Lt., Can. F.A.), Dec. 12th, 1918; Sec. Lt. (Hon. Capt.) C. E. S. Dobbs, D.S.O. (Capt., R.A.S.C.), Jan. 4th; Sec. Lt. (Hon. Lt.) R. Andrews, M.C. (Lt., Quebec R.), March 4th; Lt. W. A. Benn (Lt., Alb. R.), March 7th; Lt. C. A. Howse (Lt., B. Col. R.), March 13th; Lt. H. P. Illsley (Lt., Quebec R.), March 14th; Sec. Lt. H. G. Lindley, Lt. G. F. Turberville, Sec. Lt. R. S. Willis, Jan. 24th; Sec. Lt. R. C. Davies, Sec. Lt. J. E. Russell, Lt. H. H. Reade, Sec. Lt. H. E. Whitfield, Jan. 25th; Sec. Lt. J. Derbyshire, Sec. Lt. L. H. Henry, Sec. Lt. (Hon. Lt.) S. H. Joelson, M.C., Lt. R. T. Langdon, Lt. D. R. Tullis, Sec. Lt. E. J. Taylor, Sec. Lt. S. Whitehead, Jan 26th; Lt. E. Brown, Lt. T. S. Killingsworth, Lt. H. O. Thornton, Capt. (actg. Maj.) B. C. Windeler, A.F.C., Lt. E. Wornum, Jan. 27th; Sec. Lt. A. C. B. Ferguson, Sec. Lt. H. C. T. Gompertz, Lt. W. Howarth, Sec. Lt. S. P. Ryder, Lt. J. Tennant, M.C., Sec. Lt. H. H. Thompson, Sec. Lt. E. Wood, Jan. 28th; Sec. Lt. C. E. Gregory, Lt. C. S. Ramsay, Jan. 29th; Sec. Lt. (Hon. Lt.) A. E. Boning, Lt. J. Drew, Lt. A. N. Leckler, Lt. W. E. Southwell, Sec. Lt. F. H. V. Wood, Jan. 30th; Sec. Lt. G. F. Holford, Lt. J. Lister, Lt. J. H. Latchford, Lt. A. A. Robinson, M.C., D.F.C., Sec. Lt. A. Randall, Sec. Lt. R. I. Richards, Sec. Lt. (Hon. Lt.) F. L. Rogers, Lt. R. H. Trelease, Jan. 31st; Sec. Lt. A. W. Buck, Sec. Lt. K. D. Foster, Sec. Lt. T. Jackson, Sec. Lt. (Hon. Capt.) J. Line, A.F.C., Sec. Lt. M. Marks, Lt. B. Mansfield, Sec. Lt. J. A. Murray, Sec. Lt. W. Mottershead, Lt. (Hon. Capt.) E. L. Moxey, Sec. Lt. J. W. Reid, Sec. Lt. J. Roadhouse, Sec. Lt. A. F. Taylor, Sec. Lt. B. A. Tussaud, Sec. Lt. (Hon. Lt.) A. West, Lt. C. E. V. Wilkins, Lt. H. W. Underhill, Sec. Lt. R. Wilson, Feb. 1st; Lt. S. Clawson, Sec. Lt. W. H. A. Moncton, Capt. J. D. Foster, Sec. Lt. T. Jackson, Sec. Lt. (Hon. Capt.) J. Line, A.F.C., Sec. Lt. M. Marks, Lt. B. Mansfield, Sec. Lt. J. A. Murray, Sec. Lt. W. Mottershead, Lt. (Hon. Capt.) E. L. Moxey, Sec. Lt. J. W. Reid, Sec. Lt. J. Roadhouse, Sec. Lt. A. F. Taylor, Sec. Lt. B. A. Tussaud, Sec. Lt. (Hon. Lt.) A. West, Lt. C. E. V. Wilkins, Lt. H. W. Underhill, Sec. Lt. R. Wilson, Feb. 1st; Lt. S. Clawson, Sec. Lt. W. H. A. Moncton, Capt. J. Mitchell, M.C., D.F.C., Sec. Lt. J. Rathbone, Sec. Lt. C. V. Wood, Feb. 2nd; Sec. Lt. E. R. Lawson, Lt. J. B. Roberts (substituted for notification in "Gazette," of March 4th), Feb. 3rd; Sec. Lt. E. H. Cooke, Lt. A. Clarke, Lt. T. W. I. Dickson, Sec. Lt. H. Dobing, Lt. J. Hirst, A.F.C., Sec. Lt. T. W. I. Dickson, Sec. Lt. H. Dobing, Lt. J. Hirst, A.F.C., Sec. Lt. A. H. Hoyle, Lt. W. Hobbs, M.C., Lt. F. V. Kidson, Lt. L. G. Laws, Sec. Lt. A. B. Rattray, Sec. Lt. P. W. Robinson, Lt. K. H. G. Tilley, Sec. Lt. (Hon. Lt.) G. J. Williams, Lt. H. S. Wilcox, Lt. A. D. Wright, Feb. 4th; Sec. Lt. P. Bolton, Lt. (actg. Capt.) R. Bolton, D.F.C., Lt. N. A. J. Ewen, Sec. Lt. G. Horton, Lt. H. W. Kirk, Lt. E. C. Middleton, Sec. Lt. C. Murton, Lt. C. R. Mason, Sec. Lt. A. J. Newnham, Sec. Lt. H. Randle, Sec. Lt. A. J. H. Thornton, Lt. A. R. Tipton, Lt. M. G. Taylor, Sec. Lt. R. D. C. Vincent, Lt. (Hon. Capt.) P. K. C. Wright, Feb. 5th; Lt. C. L. W. Brading, Lt. H. F. Gaynor, Sec. Lt. L. W. G. Landon, Sec. Lt. (Hon. Lt.) D. Millar, Sec. Lt. N. Norton, Lt. R. G. C. Nairn, Lt. (actg. Capt.) N. F. Northam, Sec. Lt. T. F. Reading, Sec. Lt. W. R. H. Robinson, Sec. Lt. H. T. Taylor, Lt. G. H. Williams, Lt. M. T. Wright, Feb. 6th; Lt. H. J. Bailey, Lt. J. R. Cudemore, Lt. J. Glover, Maj. L. W. Learmouth, D.S.O., M.C., Lt. W. C. Kidd, Lt. T. A. Lidstone, Lt. D. A. J. Monro, Lt. R. Watson, Capt. J. H. Wookey, Feb. 7th; Sec. Lt. H. B. Barwise, Sec. Lt. T. E. W. Browne, Sec. Lt. E. S. Cook, Capt. C. L. Newman, Sec. Lt. W. F. Noble, Sec. Lt. S. H. Tirrell, Sec. Lt. J. Wallace, Feb. 8th; Sec. Lt. F. L. Roberts, Feb. 9th; Lt. H. D. Crofts, Sec. Lt. C. H. A. Collyns, Lt. S. J. Charles, Sec. Lt. A. W. Mumford, Sec. Lt. H. Newsham, Capt. M. G. F. Richardson, Feb. 10th; Capt. O. C. Boatillier, Lt. W. A. Cooper, Sec. Lt. D. C. Childs, Lt. H. B. Clifford, Lt. C. A. Jordan, Capt. M. R. Kingsford, Lt. T. I. L. Lloyd, Capt. C. O. F. Modin, D.S.C., Lt. (actg. Capt.) H. L. Murphy, Capt. G. L. Nicholls, Lt. C. B. Naylor, Lt. H. F. W. Robinson, Sec. Lt. O. E. Rogers, Lt. T. N. Robinson, Sec. Lt. H. D. V. Read, Lt. G. M. Robertson, Lt. A. T. Reeve, Lt. W. F. Ronald, Lt. D. I. B. Rock, Sec. Lt. J. A. Tomlinson, Lt. A. W. Tutt, Sec. Lt. F. J. Turvey, Sec. Lt. C. M. Thompson, Sec. Lt. J. B. Vickers, Feb. 11th; Sec. Lt. (Hon. Lt.) (actg. Capt.) H. C. Beeston, Sec. Lt. (Hon. Lt.) E. M. Bates, Lt. S. A. C. Bartlett, Sec. Lt. R. A. Crandall, Lt. P. H. Cleave, Lt. F. P. Critchley, Sec. Lt. J. R. Glover, Sec. Lt. H. W. Goss, Lt. S. Graham, Sec. Lt. J. M. Holling, Sec. Lt. H. C. R. Holden, Lt. M. A. Lovell, Sec. Lt. N. H. Midgley, Sec. Lt. (Hon. Lt.) A. Mills, D.F.C., Lt. C. Miller, Lt. (actg. Capt.) W. E. Nicholson, A.F.C., Sec. Lt. E. L. Rees, Sec. Lt. A. C. Roberts, Sec. Lt. J. B. Richardson, Lt. S. W. Rochford, Lt. (actg. Capt.) R. W. Rose, Sec. Lt. E. G. Turner, Sec. Lt. M. Wallace, Lt. C. C. White, D.F.C., Feb. 12th; Lt. R. H. Burrows, A.F.C., Lt. B. Instone, Lt. W. J. Hooke, Lt. T. Johnson-Gilbert, Lt. T. H. Lines, Lt. (actg. Capt.) E. Mycock, Sec. Lt. H. A. Morton, Lt. C. W. Mercer, Lt. W. S. Rope, A.F.C., Sec. Lt. W. Reader, Sec. Lt. J. H. Ratcliff, Sec. Lt. D. G. Rogers, Lt. W. R. Tate, Lt. T. H. Timmis, Sec. Lt. D. M. Thomas, Sec. Lt. A. V. W. Williams, Sec. Lt. E. S. Willis, Feb. 13th; Lt. W. E. Bardgett, Lt. E. V. Bond, Lt. W. D. Cullen, Sec. Lt. A. Clayton, Sec. Lt. R. H. Craig, Sec. Lt. A. Fairhurst, Lt. Count L. A. B. De Balme, Sec. Lt. F. D. Kilby, eSc. Lt. (Hon. Lt.) D. C. Lockwood, Lt. P. H. Redmayne, Sec. Lt. W. A. Tagg, Sec. Lt. R. J. Tucker, Sec. Lt. A. A. Turvey, Lt. J. H. M. Yeomans, Feb. 14th; Lt. R. C. S. Bowker, Lt. H. F. Blackborrow, Lt. H. R. P. Callett, Sec. Lt. J. O. Claxton, Lt. (actg. Capt.) H. M. Golding, Sec. Lt. F. G. Moore, Lt. E. E. Morgan, Lt. N. Rycroft, Lt. R. G. Richardson, Sec. Lt. W. T. Rees, Sec. Lt. G. Read, Sec. Lt. M. F. M. Wright, Lt. R. S. White, Feb. 15th; Lt. J. R. Booth, Sec. Lt. G. Crocker, Sec. Lt. G. S. Holroyd, Lt. R. I. V. Hill, Sec. Lt. R. B. Moore, Sec. Lt. D. L. Melvin, Lt. E. A. F. Reeve, Sec. Lt. E. W. Tatnall, Lt. R. C. Taylor, Feb. 16th; Sec. Lt. B. L. M. Bunting, Lt. A. Feilding-Clarke, Sec. Lt. D. L. Lewis, Sec. Lt. G. Travis, Sec. Lt. K. L. Turnbull, Lt. N. B. Wells, Feb 17th; Sec. Lt. M De W. Bamberger, Capt. A. J. Bott, M.C., Lt. W. M. Crabbie, Sec. Lt. L. G. Cocking, Lt. C. D. Grierson, Sec. Lt. G. K. Green, Sec. Lt. (Hon. Lt.) C. T. Linford, Capt. H. M. Morris, D.S.C., Lt. W. J. Morgan, Lt. G. D. H. Ross, Lt. W. Taylor, Capt. G. N. Williamson, Sec. Lt. N. Weatherley, Lt. C. J. Winstanley, Feb. 18th; Sec. Lt. G. Crowther, Sec. Lt. A. T. Guy, Lt. F. Holroyd, Lt. D. Hamilton, Lt. J. A. Inman, Lt. P. G. Kelsey, Lt. T. G. Kent, Lt. (Hon. Capt.) N. R. Mossop, Lt. J. McK Nish, Lt. J. F. Nunn, Lt. G. G. Newbury, Lt. P. J. W. Reeves, Sec. Lt. F. D. Robinson, Lt. L. A. Rivers, Lt. D. Vaughan, Lt. C. E. Wharton, Sec. Lt. R. T. Worrall, Feb. 19th; Lt. N. Bonner, Sec. Lt. P. D. Butcher, Lt. C. E. Bramhall, Lt. C. H. Clarke, Sec. Lt. H. R. Cooke, Lt. N. D. I. Gavin, Lt. M. S. C. Gordon, Sec. Lt. J. H. Lea, Sec. Lt. R. E. Linder, Sec. Lt. J. A. Munn, Lt. H. V. Northam, Lt. W. Ross, Sec. Lt. A. Rankine, Lt. J. W. Richardson, Sec. Lt. C. Sykes, Lt. G. Riley, Sec. Lt. J. S. D. Taylor, Lt. N. H. Thackrah, Lt. T. W. C. Thomson, Capt. B. A. Trochmann, Lt. K. R. Unger, Sec. Lt. F. G. Urmston, Lt. H. W White, Lt. M. J. Watson, Feb. 20th; Lt. H. A. Boyle, Sec. Lt. J. J. V Barlow, Sec. Lt. A. M. Brown, Lt. J. D. Currie, Lt. J. W. Gibson, Sec. Lt. H. S. Hind, Lt. T. G. G. Jackson, Lt. F. Kemp, Lt. E. C. S. Ringer, Lt. H. S. Redpath, Sec. Lt. C. H. Thomas, Lt. J. Taylor, Feb. 21st; Sec. Lt. (Hon Lt.) W. Black, M.C., Sec. Lt. A. L. Bloom, Lt. R. G. Frith, Sec. Lt. E. A. Grant, Sec. Lt. C. R. Gage, Sec. Lt. J. Huntley, Lt. W. Laidler, Sec. Lt. C. S. Muir, Sec. Lt. J. S. Monteith, Sec. Lt. J. Morton, Sec. Lt. S. C. Thornley, Sec. Lt. (Hon. Lt.) R. L. Tilly, Lt. C. G. Vandyk, Lt. (Hon. Capt.) O. L. Whittle, Lt. (actg. Capt.) W. Wallace, Feb. 22nd; Sec. Lt. F. Bower, Sec. Lt. (Hon. Lt.) H. E. A. E. Bolton, Sec. Lt. T. D. Brotherstone, Lt. W. J. Cockburn, Sec. Lt. J. Hunter, Lt. H. Illingworth, Lt. E. C. Hoar, Lt. H. G. L. King, Sec. Lt. J. Kilpatrick, Lt. A. J. Kilpatrick, Lt. C. W. J. Leng, Sec. Lt. E. H. Leavers, Sec. Lt. G. H. Murray, Sec. Lt. D. J. B. Monro, Lt. W. C. M. McMurray, Sec. Lt. A. B. D. McConnell, Lt. V. C. E. Martin-Gwilliam, Sec. Lt. T. Newey, Lt. L. G. Radcliffe, Sec. Lt. D. H. Tyler, Sec. Lt. C. Thomas, Lt. H. H. Tait, Sec. Lt. J. T. Whitney, Feb 23rd; Lt. F. P. Brown, Lt. W. M. P. H. Liddy, Sec. Lt. H. Newstead, Sec. Lt. E. A. Thomas, Sec. Lt. H. R. O. Tubbs, Sec. Lt. V. C. Turner, Lt. H. S. Wellby, Sec. Lt. G. W. A. Webb, Lt. J. Wingate, Feb. 25th; Lt. C. H. Crosbee, Sec. Lt. (Hon. Lt.) R. A. S. Howes, Lt. V. W. H Hillyard, Capt. W. Huggan, Sec. Lt. J. B. Isaacs, Sec. Lt. H. A. Ledgard, Sec. Lt. J. Robertson, Sec. Lt. J. A. Robb, Lt. J. Thomson, Lt. H. G. Wignall, Sec. Lt. W. S. Woodall, Feb. 26th; Lt. R. F. Boyd, Sec. Lt. B. Ibison, Lt. W. D. Jeans, Sec. Lt. H. G. Lewis, Sec. Lt. W. J. E. Lane, M.C., Sec. Lt. G. W. Moir, Sec. Lt. J. C. Marlton, Lt. E. N. MacDonald, Lt. J. C. S. Manning, Sec. Lt. J. M. MacKinnon, Sec. Lt. L. W. Thurlow, Sec. Lt. H. E. Twaits, Lt. T. W. White, Capt. W. L. Wright, Lt. H. D. H. L. Wortley, Sec. Lt. F. Wright, Feb. 27th; Sec. Lt. E. T. Brant, Lt. J. V. R. Brown, Lt. T. H. Clarke, Sec. Lt. R. Fletcher, Sec. Lt. A. Goulding, Capt. D. M. B. Gilbraith, D.S.C., Sec. Lt. J. T. Hunter, Sec. Lt. J. Hills, Lt. A. L. Kidd, Capt. R. K. Kirkman, Sec. Lt. C. Lenman, Sec. Lt. A. Mason, Lt. W. P. Neill, Sec. Lt. T. M. Ritchie, Sec. Lt. A. V. Redwood, Sec. Lt. (Hon. Lt.) L. D. Rosewell, Lt. C. B. Ridley, Lt. C. C. Robson, M.C., Lt. H. G. Tambling, Sec. Lt. W. A. Vallance, Sec. Lt. (Hon. Lt.) W. Willmer, Feb. 28th; Lt. L. A. Burns, Sec. Lt. R. O. Hughes, Lt. J. Handley, Sec. Lt. T. L. Heasman, Capt. E. J. D. Hilow, Lt. H. Johnson, Sec. Lt. Leslie, Lt. (actg. Capt.) C. B. Lancaster, Lt. A. A. Miles, Lt. D. P. McDonald, Lt. (Hon. Capt.) J. H. F. McEwan, Lt. R. J. Marshall, Lt. C. E. Mayer, Lt. C. G. Madous, Lt. W. G. Norden, Sec. Lt. R. N. Richards, Sec. Lt. (Hon. Capt.) A. C. Rankin, M.C., Sec. Lt. (Hon. Lt.) R. Tully, Maj (actg. Lt.-Col.) G. L. Thompson, D.S.C., D.F.C., Lt. C. Taylor, Lt. H. H. Thompson, Lt. D. Wright, Lt. J. Webster, M.C., Lt. H. E. A. Waring, Lt. W. K. Wilson, Lt. (Hon. Capt.) J. G. Young, March 1st; Lt. A. E. Crisp, Sec. Lt. F. F Crump, Capt. W. B. Ives, Lt. J. C. Lees, Lt. W. T. Lewis, Lt. H. L. Leroy, Lt. R. G. Lawson, Sec. Lt. J. McAlsan, Lt. L. H. Raybould, Lt. M. C. Radford, Lt. G. A. Rance, Sec. Lt. H. Tannenbaum, Sec. Lt. E. A. F. Wilding, Lt. M. E. Woods, Lt. G. F. Westcott, Lt. F. H. Wilson, March 2nd; Lt. H. G. Buckley, Lt. W. R. L. Jenkins, Sec. Lt. P. U Keeney, Lt. H. G. Kirkland, Sec. Lt. W. H. Lange, Lt. O. J. Lange, Capt. H. A. Mumford, Lt. H. Naylor, Lt. R. B. Thompson, March 3rd; Sec. Lt. F. Collins, Sec. Lt. A. E. Doncaster, Sec. Lt. A. W. Fishes, Sec. Lt. R. B. Hyslop, Sec. Lt. C. J. H. Homer, Lt. C. B. Holland, Sec. Lt. J. E. Lowdon, Sec. Lt. (Hon. Lt.) W. T. Mitchell, Sec. Lt. G. W Mitchell, Lt. O. D. Maxted, Lt. C. H. March, Sec. Lt. C. W. Noel, Lt. R. P. Nowell, Lt. R. A. Roth, Sec. Lt. G. G. Ross, Lt. W. O. Russell, Sec. Lt. A. J. D. Rowan, Sec. Lt. G. E. A. Rice, Sec. Lt. R. Rathbone, Sec. Lt. (Hon. Lt.) H. Reddaway, Sec. Lt. G. C. Russell, Sec. Lt. C. L. Talmadge, Sec. Lt. P. McL. Wallace, Sec. Lt. G. H Waddup, Sec. Lt. J. B Young, March 4th; Sec. Lt. W. H. Brown, Sec. Lt. A. G. Currington, Sec. Lt. G. C. Crookshanks, Lt. F. T. Collins, Lt. H. Constant, Lt. G Gibbs, Lt. D. G. Gold, Sec. Lt. H. G. Goddard, Sec. Lt. F. M. Honore, Sec. Lt. (Hon. Lt.) H. W. Holland, Sec. Lt. D. Keiller, Sec. Lt. T. Lees, Sec. Lt. E. Leicester, Lt. L. C Lane, Sec. Lt. S. M. Morris, Lt. E. S. Moore, Lt. R. W. B. Matthewson, Lt. L. Marsh, Sec. Lt. S. B. Taylor, Lt. F. Weston, Sec. Lt. A. C Weeks, Lt. J. G. Wilson, Lt. G. M. C. T Whitehead, Lt. R. C. Williams, Lt. A. E. Webber, Lt. (Hon. Capt.) C B. Wilson, Lt. J. R. Wilson, Lt. J. B. H. Wyman, May 5th; Sec. Lt. E. T. Adams, Sec. Lt. P. H. D. Blackman, Lt. F. C. Browne, Lt. (Hon

Capt.) **to** be Lt. Beater, D.F.C., Sec. Lt. H. L. Cross, Capt. E. B. P. Davis, Sec. Lt. A. E. Filby, Sec. Lt. N. Johnson, Sec. Lt. S. E. King, Lt. J. F. Lloyde, Capt. B. A. Millson, D.S.C., Sec. Lt. A. L. Muir, Sec. Lt. J. Myers, Lt. H. H. Myers, Sec. Lt. (Hon. Capt.) R. C. Norris, Lt. J. M. Nichol, Sec. Lt. L. Nicholls, Sec. Lt. H. C. J. Routledge, Sec. Lt. J. J. Rankin, Lt. J. Racine, Lt. J. F. Reed, Sec. Lt. A. Rouse, Lt. F. Whiteley, March 8th; Lt. E. E. M. Coombes, Lt. G. De Gaye, Maj. J. B. F. Fetham, D.S.O., Sec. Lt. W. M. Herriot, Lt. (actg. Capt.) B. H. Hunt, Sec. Lt. N. D. Hume, Lt. G. H. Ingram, Capt. F. R. Johnson, D.S.C., Lt. F. K. Johnson, Sec. Lt. W. S. D. Kinsey, Sec. Lt. V. Lock, Sec. Lt. C. G. Marun, Sec. Lt. A. G. Marshall, Sec. Lt. J. K. Nixon, Sec. Lt. G. H. New, Lt. E. B. Robinson, Sec. Lt. H. T. W. Robey, Capt. H. Robertson, Sec. Lt. C. J. Ralph, Lt. H. T. Rawlinson, Lt. B. Kansford, Sec. Lt. R. K. Robins, Lt. E. H. Tredcroit, D.F.C., Lt. A. E. Thompson, Lt. S. F. Thompson, Sec. Lt. W. K. Vane, Capt. F. W. Winterbotham, Sec. Lt. C. J. Willcox, Lt. F. Whiteley, Sec. Lt. (Hon. Lt.) F. A. W. Willis, Sec. Lt. J. C. Wilson, Sec. Lt. (Hon. Lt.) C. B. O. Walker, March 7th; Sec. Lt. C. R. Boyd, Lt. R. G. Cummings, Sec. Lt. T. Cuthbert, Sec. Lt. L. A. Codd, Lt. L. S. Collins, Lt. H. G. Dugan, Sec. Lt. W. E. Franklin, Lt. A. F. Goodchap, Lt. H. C. Grimes, Sec. Lt. C. K. K. Horton, Capt. J. F. Horsey, Sec. Lt. C. Hansen, Sec. Lt. M. P. Laffeur, Sec. Lt. G. A. Mann, Sec. Lt. A. J. Mullin, Lt. A. R. Naiser, Sec. Lt. K. H. Rose, Lt. A. W. Robertson, D.F.C., Sec. Lt. P. J. Swan-Jagger, Sec. Lt. G. C. Williamson, Lt. W. Wild, Sec. Lt. E. G. Woods, Sec. Lt. S. R. Wells, March 8th; Sec. Lt. R. H. Ash, Lt. A. L. Baker, Lt. J. A. Cairns, Sec. Lt. J. F. Christopherson, Lt. A. T. Daw, Lt. S. J. Davies, Sec. Lt. L. Goater, Lt. G. Howe, Lt. W. W. Jones, M.C., Sec. Lt. N. A. Nicholson, Capt. E. A. Mckay, M.C., D.F.C., Sec. Lt. A. C. Macleod, Lt. C. Mcevoy, D.F.C., Lt. E. R. Manley, Lt. J. Rees, Lt. (actg. Capt.) E. J. Wessely, Lt. L. L. Chapman, Sec. Lt. C. R. Claxton, Sec. Lt. W. R. Kempson, Sec. Sec. Lt. L. F. Wilson, March 9th; Sec. Lt. G. T. Coles, Sec. Lt. (Hon.) R. D. King, Sec. Lt. A. C. Marsh, Lt. G. B. Mcmichael, Lt. R. A. Nicholson, Sec. Lt. A. Maltyre, Sec. Lt. J. A. Ritchie, March 10th; Capt. H. H. Arundel, Capt. J. W. Alcock, D.S.C., Sec. Lt. E. Everington, Lt. L. P. Gilliard, Lt. R. R. F. Gill, Sec. Lt. H. G. Holmes, Sec. Lt. E. W. King, Lt. K. H. Loosemoor, Sec. Lt. T. C. Lewis,, Lt. W. Mcintosh, Sec. Lt. C. S. D. Mcleod, Lt. A. M. Morgan, Sec. Lt. W. Rudall, Sec. Lt. R. Robertson, Sec. Lt. G. Turner, Sec. Lt. H. Vost, Sec. Lt. A. H. Williams, Sec. Lt. A. Wright, Sec. Lt. H. Whitley, Sec. Lt. S. Whitenouse, Capt. K. F. E. Wickham, Lt. (Hon. Capt.) A. B. Yuille, D.F.C., Lt. (actg. Capt.) E. L. Zink, March 11th; Lt. E. Adlington, Lt. F. G. Ashford, Sec. Lt. A. Blackwell, Sec. Lt. L. K. Clark, Lt. W. F. Crundall, Sec. Lt. C. J. De Laplante, Sec. Lt. S. W. Hedgcock, Sec. Lt. R. G. Hulley, Lt. H. Hodgson, Sec. Lt. J. Hall, Sec. Lt. R. Lane, Lt. C. G. Lush, Lt. H. G. B. Linnell, Lt. A. W. Manoy, Lt. R. K. Mcconnell, D.F.C., Sec. Lt. J. G. Mcennyre, Lt. R. A. Marun, Lt. E. G. Rummit, Lt. F. C. Russell, Sec. Lt. (Hon. Lt.) N. Riddell, Sec. Lt. H. R. Mcl. Reid, Sec. Lt. (Hon. Lt.) T. P. Robinson, Sec. Lt. J. M. Russell, Sec. Lt. W. Rozzi, Lt. G. Taylor, Capt. G. L. Willcox, M.C., Sec. Lt. H. Wittup, March 12th; Sec. Lt. A. Arthur, Lt. E. N. Thomas, Capt. F. D. Taylor, Lt. Burcher, Lt. R. B. Carey, Lt. T. T. Cumming, Sec. Lt. J. C. S. Calder, Lt. E. O. Cudmore, Sec. Lt. A. W. Forsyth, Sec. Lt. G. Gedge, Lt. M. Goudie, Sec. Lt. D. R. Goudie, Capt. M. G. Gill, Sec. Lt. E. B. Hubbard, Sec. Lt. C. Hargreves, Capt. S. K. Hoblyn, Lt. R. W. Kerr, Sec. Lt. (Hon. Lt.) J. B. Kemshall, Sec. Lt. J. Sc. Lewis, Lt. W. G. Laddoon, Lt. J. Mcdonald, A.F.C., Lt. (Hon. Capt.) H. H. de B. Monk, M.C., Capt. F. G. Marr, Lt. W. F. Scott-Kerr, Lt. C. V. Wheatley, Lt. E. J. Whyte, D.F.C., March 13th; Sec. Lt. C. B. Branson, Lt. (actg. Capt.) G. W. Cudemore, Lt. E. R. Farmer, Lt. D. W. Kent-Jones, Lt. N. H. Kilby, Lt. (actg. Capt.) A. S. Kelly, Sec. Lt. (Hon. Lt.) J. Kett, Lt. S. Leslie, Lt. H. Marshall, Sec. Lt. C. H. Thompson, Lt. A. E. Withers, March 14th; Lt. R. S. Barbour, Sec. Lt. G. L. Button, Lt. D. R. Cameron, Sec. Lt. G. L. W. J. Finch, Sec. Lt. F. E. Finch, Sec. Lt. W. E. Grainger, Lt. R. C. Husband, Lt. G. R. E. Hayter, Lt. W. Jack, Lt. E. A. W. Kent, Lt. C. T. Mansell, Capt. D. C. Miller, Sec. Lt. J. Mcculium, Lt. A. W. Russell, Lt. (actg. Capt.) W. E. Reed, March 15th; Lt. (actg. Capt.) H. P. Chubb, Lt .W. W. Frederickson, Sec. Lt. C. S. Frost, Lt. C. G. D. Gray, Sec. Lt. M. I. Hough, Sec. Lt. A. R. Hedgcock, Sec. Lt. J. G. Hall, Lt. W. Ingleson, Sec. Lt. E. E. James, Sec. Lt. A. W. Kilpatrick, Capt. D. B. King, Sec. Lt. M. H. Molyneux, Lt. J. G. Richards, Lt. W. M. Worrman, March 16th; Lt. G. Weekes, Sec. Lt. C. S. Bragg, Sec. Lt. (Hon. Lt.) E. H. Cook, Sec. Lt. W. Forbes, Lt. E. T. Hendrie, Sec. Lt. W. Jacklin, Lt. H. T. Kemp, Sec. Lt. V. Lockey, Sec. Lt. T. L. Lysaght, Sec. Lt. C. F. Lamb, Sec. Lt. C. H. Long, Lt. D. M. Lees, Lt. N. Ramsden, Capt. A. C. Reid, D.F.C., Sec. Lt. A. Whichelow, Sec. Lt. A. T. Williams, March 17th; Sec. Lt. P. C. Brown, Lt. (actg. Capt.) G. Broome, Lt. H. L. Button, Sec. Lt. R. D. Clerk, Lt.-Col. H. Delacombe, Sec. Lt. H. Dodd, Lt. (actg. Capt.) R. N. C. Fenton, Sec. Lt. (actg. Capt.) M. Forsyth, Lt. G. W. Ferguson, M.C., Lt. E. G. Gilder, Lt. E. W. Hellier, Sec. Lt. W. W. Ingram, Capt. G. D. Kirkpatrick, Lt. R. A. Maddock, Lt. C. T. V. Marshall, Lt. R. F. Mullinas, Sec. Lt. J. Mcewan, Lt. W. P. Watt, Lt. F. Welmsley, March 18th; Sec. Lt. J. L. Bullard, Sec. Lt. P. Bolland (L'pool R.), Sec. Lt. A. P. C. Bruce, Lt. G. J. Cooper, Sec. Lt. T. R. G. Cooke, Lt. W. H. Clarke, Lt. T. G. Deason, Sec. Lt. R. H. Dunn, Sec. Lt. G. Hall, Sec. Lt. A. V. Hale, Lt. C. F. Halford, Lt. F. B. Jones, Sec. Lt. J. W. Johnson, Lt. C. Kerr, Sec. Lt. L. W. Luce, Sec. Lt. W. Meredith, Lt. A. Tait, Lt. S. W. Watson, Sec. Lt. R. F. Whyte, March 19th; Sec. Lt. F. J. H. Bacon, Sec. Lt. W. J. Bedworth, Captain W. H. Demel, Lieut. A. J. Dunton, Lieut. C. E. Hurst, Sec. Lieut. (Hon. Lieut.) A. Holland, Lieut. C. R. Hurst, Sec. Lieut. A. A. Jackson, Lt. A. E. King, Lt. C. W. Lewis, Sec. Lt. J. C. Lovelace, Sec. Lt. H. Lorrimer, Sec. Lt. R. Logan, Sec. Lt. A. H. Wilson, Lt. P. S. Williams, March 20th; Lt. G. Colledge, Sec. Lt. B. O. Davis, Lt. H. E. Galer, Sec. Lt. F. W. Gordon, Lt. R. F. B. Hall, Sec. Lt. H. Warburton, Lt. W. H. McF. Watt, Sec. Lt. A. G. H. Williamson, March 21st; Sec. Lt. J. F. Foggo, Lt. N. H. Witter, March 22nd; Lt. J. Boyd, Sec. Lt. G. R. Marsh, March 23rd; Lt. R. O. Hobhouse, Lt. H. C. Hamilton, Sec. Lt. G. Welch, March 25th; Capt M. G. Dover, March 26th; Lt. W. F. Long, March 28th.

Capt. W. P. C. Chambers resigns his commn., April 2nd.

Lt. W. S. Berkett relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, April 2nd.

Sec. Lt. R. W. Brigstock relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, April 2nd.

Sec. Lt. G. H. E. Roxburgh (High. L.I.) relinquishes his commn. on account of ill-health, April 2nd.

The surname of Lt. (actg. Capt.) G. B. Gates is as now described, and not Bates as stated in "Gazette," Sept. 3rd, 1918.

The Christian names of Sec. Lt. James Wilfred Sykes are as now described, and not as stated in the "Gazette," Sept. 3rd, 1918

The notification in "Gazette," May 17th, 1918, concerning Sec. Lt. F. J. H. Bacon is cancelled.

The notification in "Gazette," March 18th, concerning Lt. K. P. McGowan is cancelled.

Administrative Branch.—Maj. M. Marsden to be Maj., from (S.O.), March 25th.

Lts. to be Lts.:—A. N. Jenks (Quebec R.), from (O.), Dec. 13th, 1918; B. C. Rylands, from (A.), Jan 3rd.

Sec. Lt. E. O. Johnson to be Lt., Jan. 13th.

Sec. Lts. to be Sec. Lts.:—C. Wright, from (O.), Feb. 8th; E. M. Prichard, from (A.), Feb. 20th.

Lt. F. C. Lynch-Blosse (Lt., Ir. Gds.) relinquishes his commn. on ceasing to be empld., Feb. 15th.

The following are transferred to unempld. list:—Sec. Lt. E. Albert, Jan. 16th; Sec. Lt. F. H. Wrigley, Jan. 14th; Sec. Lt. H. E. Larsen, Sec. Lt. W. C. Rose, Sec. Lt. E. S. Ruddle, Jan. 17th; Sec. Lt. C. W. Curtis, Lt. F. A. Rudd, Jan. 18th; Sec. Lt. (Hon. Lt.) (actg. Capt.) I. P. Venner, Jan. 19th; Sec. Lt. F. Newton, Sec. Lt. A. S. Tarte, Jan. 21st; Sec. Lt. F. W. K. Joanson, Sec. Lt. F. H. Lythall, Jan. 22nd; Sec. Lt. S. E. Arridge, Jan. 24th; Lt. K. M. Grahame, Sec. Lt. T. E. Read, Sec. Lt. R. B. Wigutman, Jan. 25th; Sec. Lt. J. H. W. Huber, Sec. Lt. J. F. Robertson, Sec. Lt. R. J. Woods, Sec. Lt. R. Wilson, Sec. Lt. F. J. T. Woodard, Jan. 28th, Sec. Lt. H. A. Winter, Jan. 29th; Sec. Lt. (actg. Lt.) G. R. Neal, Sec. Lt. A. E. Turner, Jan. 30th; Capt. (actg. Maj.) D. B. O. F. Lord Redesdale, Jan. 31st; Sec. Lt. A. C. Muirhead, Lt. (actg. Capt.) C. F. Upton, Sec. Lt. W. Rae, Feb. 1st; Sec. Lt. A. E. P. Cole, Sec. Lt. W. Johnstone, Feb. 3rd; Sec. Lt. S. G. Minchin, Lt. (actg. Capt.) F. Robinson, Sec. Lt. L. E. Tutt, Feb. 4th; Capt. W. H. Rodd, Feb. 5th; Sec. Lt. J. F. George, Sec. Lt. H. Hood, Lt. V. F. Long, Sec. Lt. (actg. Lt.) R. Needham, Feb. 6th; Sec. Lts. D. A. J. Buxton, J. Curdie, Feb. 8th; Capt. J. W. Moore, Feb. 9th; Sec. Lt. (actg. Lt.) D. C. Recordon, Feb. 10th; Sec. Lt. D. Garland, Sec. Lt. H. S. Thomson, Feb. 11th; Lt. E. Butler, Sec. Lt. H. W. Homer, Sec. Lt. R. S. Roberts, Lt. T. Rawsthorne, Sec. Lt. J. F. Young, Feb. 12th; Sec. Lt. J. Kothera, Feb. 13th; Sec. Lt. A. F. Batchelor, Sec. Lt. R. J. Gregory, Sec. Lt. A. W. Murray, Sec. Lt. E. W. Tucker, Sec. Lt. T. G. D. Thomas, Sec. Lt. J. W. Welch, Capt. J. M. St. Clair, Feb. 15th; Sec. Lt. E. J. Gallagher, Sec. Lt. V. F. Wilkins, Feb. 16th; Sec. Lt. C. H. Bartlett, Sec. Lt. (actg. Lt.) W. E. Lambert, Feb. 17th; Lt. E. G. Roberts, Sec. Lt. F. G. Robinson, Sec. Lt. R. Trueman, Capt. F. Wilkinson, Sec. Lt. H. W. Weedon, Feb. 18th; Sec. Lt. F. E. Dow, Lt. H. G. Lyne, Sec. Lt. I. R. B. Mellish, Lt. (actg. Capt.) H. F. Pate, M. B. E., Feb. 19th; Sec. Lt. (Hon. Lt.) E. R. Brydges, Sec. Lt. A. B. Clay, Sec. Lt. C. H. Leland, Sec. Lt. B. A. Ross, Lt. (Hon. Capt.) (actg. Capt.) R. F. Wills, Sec. Lt. A. Wilkinson, Feb. 20th; Sec. Lt. W. R. Butler, Sec. Lt. W. H. Munns, Sec. Lt. S. W. Tinham, Feb. 21st; Lt. E. Colman Brown, Feb. 22nd; Sec. Lt. J. M. Holloway, Sec. Lt. H. Hodgson, Sec. Lt. A. Hackle, Sec. Lt. A. Murdoch, Feb. 23rd; Sec. Lt. J. G. Cheshire, Sec. Lt. C. E. Hughes, Sec. Lt. A. L. Kent, Feb. 24th; Sec. Lt. F. Crawford, Capt. (actg. Maj.) H. Jullerot, A.F.C., Lt. A. G. R. Mackenzie, Lt. (actg. Capt.) T. H. Nesbitt, Feb. 25th; Sec. Lt. E. H. Church, Sec. Lt. R. H. A. Nayler, Sec. Lt. G. F. Wilson, Feb. 27th; Capt. H. J. Evans, Sec. Lt. E. Kemble, Sec. Lt. J. Whittaker, Feb. 28th; Lt. G. Little, Sec. Lt. E. V. Wheeler, Maj. (actg. Lt.-Col.) R. F. Williams, Sec. Lt. R. S. L. Worsley, March 1st; Lt. M. Bridgewater, March 2nd; Capt. (actg. Maj.) S. S. Macaskie, March 3rd; Sec. Lt. D. J. Brooks, Capt. G. G. Fiddes, Lt. (actg. Capt.) R. H. Gray, Sec. Lt. J. C. Gordon, Lt. W. S. Keene, Sec. Lt. A. Mc-Kenzie, Sec. Lt. (Hon. Lt.) E. N. Thomas, Capt. F. D. Taylor, Lt. G. A. F. Hippisley, March 4th; Sec. Lt. H. E. Miles, Sec. Lt. T. S. Millar, Sec. Lt. S. Nicholson, March 5th; Lt. A. B. Bullock, Lt. H. F. J. Capelli, Lt. E. M. Letts, Lt. P. Maggs, Lt. S. Rodgers, Lt. R. Temple, March 6th; Sec. Lt. R. H. Abell, Sec. Lt. A. J. Coxon, Sec. Lt. N. W. Lucas, Sec. Lt. G. G. O. Manton, Sec. Lt. W. E. Randall, Sec. Lt. H. T. Robin-son, March 7th; Sec. Lt. J. Cryan, Sec. Lt. H. Chadwick, Lt. J. F. Fielding, Sec. Lt. H. W. Moore, Capt. C. A. McInroy, Sec. Lt. G. S. Rowley, March 8th; Lt. (actg. Capt.) R. C. Clements, March 9th; Lt. (actg. Capt.) H. Jackson, March 10th; Lt. L. H. Colman, Sec. Lt. C. S. Colman, Sec. Lt. L. W. Foot, Lt. J. K. Line, Sec. Lt. C. Rockliff, Maj. G. B. Rickards, Lt. (actg. Lt.) E. A. Woods, March 12th; Lt. C. M. Atkinson, Lt. T. M. Golding, Sec. Lt. H. A. Lambert, March 13th; Lt. L. J. Gavin, Lt. P. C. O. Riddell, Sec. Lt. V. R. Roberts, March 13th; Sec. Lt. (Hon. Lt.) A. Chalk, Sec. Lt. R. E. E. Humble, Sec. Lt. K. T. Irwin, Sec. Lt. F. D. Johnson, Sec. Lt. A. T. McNight, March 14th; Lt. H. Castle (L'pool R., T.F.), Sec. Lt. (Hon. Lt.) (actg. Lt.) J. S. Craig, Capt. (actg. Manchester, Lt. W. Luke, Sec. Lt. (actg. Lt.) R. E. G. MacMaster, March 15th; Lt. (actg. Capt.) A. W. Brittain, Capt. F. Fernihough, Sec. Lt. J. M. C. Lawson, Sec. Lt. H. S. Keddick, March 16th; Lt. G. Carruthers, Sec. Lt. G. Crusoe, Capt. H. W. Guy, March 19th; Lt. G. W. Gregory, Sec. Lt. H. L. Roper, March 20th; Sec. Lt. R. M. Ferguson, Sec. Lt. A. E. Walker, March 21st; Capt. H. Batsford, Sec. Lt. C. H. Dickins, Capt. G. Haslam, Lt. T. W. Kirkpatrick, March 22nd; Sec. Lt. M. Worms, Lt. N. J. Wenger, March 23rd; Capt. V. Finnigan, Sec. Lt. F. G. Laight, March 25th.

The surname of Lt. (actg. Capt.) J. G. Gyrie is as now described, and not as Pyrie as stated in "Gazette," Feb. 21st.

The notification in "Gazette," March 14th, concerning Lt. T. L. Green is cancelled.

The notification in "Gazette," March 25th, concerning Sec. Lt. H. B. Elbourne is cancelled.

Technical Branch.—Maj. (actg. Lt.-Col) H. R. Vagg to be Maj. (Grade A), and relinquishes the actg rank of Lt.-Col. on ceasing to be empld. as Lt.-Col., March 12th.

Lt. T. C. Penna to be actg. Capt. whilst empld as Capt (Grade B), Aug. 12th, 1918.

Sec. Lt. (actg. Lt.) A. C. F. Hill to be actg. Capt. whilst empld. as Capt. (Grade B), from (Ad.), Sept. 14th, 1918.

Lt. S. Symonds to be graded for purposes of pay as Lt. whilst empld. as Lt. (Grade B), Oct. 22nd, 1918.

Sec. Lt. A. Y. Baker to be actg Lt whilst empld. as Lt. (Grade B), Dec. 16th, 1918.

Sec. Lt. (Hon. Capt.) C. C. Clark to be Sec. Lt. (Grade A), from (Grade B), and to be Hon. Capt., March 4th.

Sec. Lt. H. B. Chorley to be Sec. Lt. (Grade B), from (Ad.), Dec. 11th, 1918.

Capt. W. B. Daniels (Lt., R.N.V.R.) relinquishes his commn. on ceasing to be empld., Dec. 30th, 1918.

The following are transferred to the unempld. list:—Lt. C. Clayden, Jan 11th; Sec. Lt. G. P. Richards, Jan. 13th; Lt. F. T. Russell, Jan. 16th; Sec. Lt. A. E. Allen, Capt. A. D. Lang, Jan. 17th; Sec. Lt. W. Griffiths, Jan 23rd; Lt. H. Gray, Jan. 25th; Sec. Lt. H. Linfield, Sec. Lt. J. Norman, Jan. 26th; Sec. Lt. (actg. Lt.) F. P. Lambert, Jan. 27th; Lt. (actg. Capt.) H. J. Taplin, Jan. 28th; Sec. Lt. A. Newbury, Jan. 29th; Lt. T. E. H. Bristow, Lt. N. W. Rostron, Sec. Lt. J. D Robinson, Maj. C. C. Turner, Maj. (actg. Lt.-Col.) W. Wright, D.S.O., Jan. 30th; Maj. E. G. L. Roberts, Maj Hon. W. T. Whiteley, Sec. Lt. F. Williams, Lt. (Hon. Lt.) G. W. G Tucker, Sec. Lt. A. D. Tyler, Sec. Lt. (actg. Lt.) W. Winterbottom, Sec. Lt. R. B. Winyard, Feb. 1st; Lt. H. F. Reid, Feb. 3rd; Sec. Lt. J. F Crichton, Sec. Lt. C. Marley, Lt. L. J.

Wood, Feb. 4th; Sec. Lt. A. Laurie, Lt (actg. Capt.) F. E. Reiss, M.C., Sec. Lt. P. J. Rixon, Feb. 7th; Lt. D. A. Lewis, Feb. 8th; Sec. Lt. C. Lewis, Capt. W. G. G. Munsie, Feb. 9th; Sec. Lt. C. S. Armishaw, Capt. A. A. Bryce-Burden, Feb 10th; Sec. Lt. (Hon. Lt.) B. H. Lodge, Lt. A. C. Nixon, Sec. Lt. C. W. Raymond, Lt. C. Woodall, Feb 11th; Lt. J. P. Burden, Sec. Lt. E. M.-S. Levin, Lt. M. Myers, Sec. Lt. C. S. Richards, Feb 12th; Sec. Lt. (actg. Capt.) L. M. Nava, Lt. H. C. Toye, Lt. A. A. D. Toolis, Sec. Lt. W. G. Walker, Feb. 14th; Capt. F. W. Musson, Lincoln, Mar. 2nd; Capt. E. A. Richards, Maj. H. E. Bakes, A.F.C., Sec. Lt. H. A. Welch, Feb. 14th; Lt. H. Bateman, Lt. H. Churchman, Lt. C. H. Gardner, Capt. P. M. E. Impey, Lt. (actg. Capt.) D. H. Moore, Sec. Lt. P. W. Rowe, Lt.-Col. (actg. Brig.-Gen.) J. G. Weir, C.M.G., Feb. 15th; Sec. Lt. G. Colbert, Lt. (actg. Capt.) L. Tavener, Feb. 16th; Sec. Lt. J. Clennell, Capt. J. C. Rennie, Capt. C. L. Robinson, Lt. D. R. M. Wright, Feb. 18th; Lt. R. A. Ralcigh, Sec. Lt. W. E. Trueman, Lt. P. K. Turner, Lt. J. H. Valentine, Feb. 19th; Capt. J. Hibbert, Sec. Lt. J. F. Hurst, Sec. Lt. S. G. Tackaberry, Feb. 20th; Capt. (actg. Maj.) F. A. Bumpus, Feb. 21st; Lt. R. N. K. Jones, M.C., Lt. (actg. Capt.) C. R. Lodge, Sec. Lt. R. B. Whittick, Feb. 22nd; Sec. Lt. O. C. Haynes, Feb. 23rd; Sec. Lt. (Hon. Lt.) (actg. Capt.) R. T. Lattey, Capt. P. Mowle, Feb. 24th; Capt. L. H. Clifford, Lt. (actg. Capt.) H. Jones, Sec. Lt. (Hon. Lt.) C. L. Loyd, Sec. Lt. (actg. Capt.) W. R. Munro, Sec. Lt. H. S. Wood, Feb. 25th; Sec. Lt. T. D. H. Bruce, Sec. Lt. C. R. Holmes, Maj. T. C. Hull, Sec. Lt. E. Mathias, Lt. (Hon. Capt.) C. H. Murland, Capt. R. A. Tanner, Feb. 26th; Maj. C. G. Martyn, Capt. A. Mackay, Lt. (actg. Capt.) P. B. Moxon, Feb. 27th; Sec. Lt. R. W. P. Murch, Feb. 28th; Lt. H. Best, Capt. E. W. Keesey, Sec. Lt. (Hon. Lt.) L. E. Lomas, Lt. H. Lloyd, Capt. G. D. Lanyon, Lt. R. R. Macgregor, Capt. Sir C. C. Mantell, Bt., Lt. S. F. Roberts, Capt. H. D. Teague, Lt. (actg. Maj.) R. Thynne, Lt. A. B. Willcocks, March 1st; Capt. C. Eightlion, March 2nd; Sec. Lt. D. G. Robinson, Lt. E. V. White, March 3rd; Lt. R. F. Cook, Sec. Lt. (Hon. Lt.) G. Craig, Capt. G. E. Liggs, Lt (actg. Capt.) G. F. Lucas, Lt. T. H. Levett, Lt. C. J. Mahony, Capt. M. G. Millar, Sec. Lt. H. S. Reid, Sec. Lt. S. J. Wise, March 4th; Lt. (actg. Capt.) C. Curwen, Lt. A. Elliott, Lt. F. O. Gibbon, March 5th; Lt. J. Brown, Lt. L. A. Clayton, Lt. W. G. Cullen, Sec. Lt. (actg. Lt.) W. D. Corp, Lt. R. S. Howard, Sec. Lt. P. O. Lovett, Sec. Lt. W. S. Vipond, Sec. Lt. A. J. Winter, March 12th; Lt. G. T. C. Gunn, Sec. Lt. (actg. Lt.) H. de S. Hodson, Sec. Lt. C. W. P. Harvey, Sec. Lt. A. B. Redstone, Sec. Capt. L. G. Cleete, Maj. T. Cosgrave, Lt. (actg. Capt.) H. G. Connell, Lt. C. A. Weston, Lt. C. H. Whitehouse, March 13th; Sec. Lt. (Hon. Sec. Lt. J. G. F. Moore, March 14th; Sec. Lt. J. O. Clover, Lt. E. J. Girdler, Lt. G. Gilbert, Capt. L. Leoffler, Capt. L. R. Kerridge, March 15th; Maj. D. C. Willock, March 16th; Sec. Lt. A. Dalziel, Lt. J. S. Franklin, Sec. Lt. R. V. Hart, Capt. (actg. Maj.) C. Ralston, Sec. Lt. V. A. Whitehead, March 17th; Lt. E. W. Edwards, Sec. Lt. H. Grant, Capt. D. A. B. Hill, Sec. Lt. E. B. Hodgkinson, Sec. Lt. R. L. T. Latour, Sec. Lt. R. P. McDougall, March 18th; Sec. Lt. (Hon. Lt.) W. F. Baker, Sec. Lt. (actg. Capt.) R. Bonser, Sec. Lt. (actg. Capt.) H. D. Barry, Sec. Lt. (Hon. Lt.) (actg. Lt.) R. A. Carswell (Sco. Rif., T.F.), Capt. A. H. Dunnagan, Capt. L. V. Drake, Sec. Lt. L. Hawes, Sec. Lt. W. W. McDowell, March 19th; Lt. (actg. Capt.) H. S. Hewitt, Sec. Lt. A. Kennish, Capt. A. H. Peake-Jones, March 20th; Lt. N. L. Godber, Sec. Lt. A. J. Higgins, March 21st; Sec. Lt. R. W. Atchley, Capt. (actg. Maj.) J. H. Banks, Lt. M. B. Cole, Maj. J. R. Elsden, Maj. E. A. Falconer, Maj. C. Hartley, M.C. (Hon. Lt.-Col.), Lt. (actg. Capt.) J. Peters, Capt. (actg. Maj.) C. H. T. Alston, Capt. F. A. Cobb, Lt. C. L. Cliffe, Capt. J. R. Gibb, Capt. C. A. Higgins, Sec. Lt. H. A. Ward, Lt. G. W. Wilkin, Lt. H. B. Wakefield, March 23rd; Maj. T. R. H Garrett, Capt. A. G. Ionides, March 24th; Capt. F. M. Harding, Sec. Lt. E. R. W. Lincoln, March 25th; Sec. Lt. J. Imber, Sec. Lt. A. M. Layfield, March 26th; Lt.-Col. C. F. Jenkin, M.B.E., March 31st.

Lt. J. P. Rowell resigns his commn., April 2nd.

Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—G. J. Cannon, C. F. Murrin, contracted on service, April 2nd.

Medical Branch.—Lt.-Col. C. B. Heald, C.B.E., to be Lt.-Col., from (S.O.), Feb. 10th.

The following are transferred to unemptd. list :—Capt. Ff. Roberts, Feb. 5th; Lt. K. Batten, Feb. 6th; Lt. P. Ashton, Feb. 11th; Lt. C. A. E. Cody, Feb. 16th; Lt. G. A. Roper, Lt. A. Read, Feb. 20th; Capt. (Hon. Lt.-Col.) J. MacLaughlin, Feb. 22nd; Capt. A. A. Wilkinson, Feb. 25th; Capt. (actg. Maj.) A. A. Bisset, March 1st; Capt. E. W. W. Jones, March 4th; Capt. E. P. Chennells, March 9th; Capt. T. E. Regan, Capt. L. C. Rivett, March 11th; Capt. A. B. Bridgland, March 12th; Lt. J. D. George, Capt. N. D. Lloyd, Lt. R. F. Rymer, Capt. A. H. L. Thomas, March 13th; Capt. H. F. Helsham, Lt. S. Harbinson, March 19th.

Dental Branch.—Lt. H. N. Hillier is transferred to unemptd. list, Feb. 21st.

Physical Training Branch.—Capt. V. C. Hollender is transferred to unemptd. list, March 6th.

Memoranda.—Lt. H. J. S. Ferry relinquishes his commn. on ceasing to be emptd., Jan. 18th.

The following are transferred to unemptd. list, from (S.O.) :—Sec. Lt. (actg. Capt.) A. W. Rippon, Jan. 24th; Capt. (actg. Maj.) H. Welch, Jan. 25th; Capt. (actg. Maj.) J. G. Howell, M.C., Jan. 28th; Lt. St. B. Goldsmith, Jan. 31st; Maj. H. W. Lees, Lt. (actg. Maj.) J. P. Cass, Capt. (actg. Maj.) C. Cruickshank, Feb. 1st, Maj. Hon. M. Baring, O.B.E., Feb. 11th; Capt. J. D. Greenwood, Feb. 17th; Lt. (actg. Capt.) A. Cunningham-Reid, Feb. 18th; Lt. (actg. Maj.) P. C. Hoyland, M.B.E., Feb. 27th; Maj. D. Illingworth, Lt. (Hon. Capt.) (actg. Capt.) P. E. Tickler, March 1st; Capt. H. P. S. Clogstoun, M.B.E., Capt. C. K. Junp, March 2nd; Lt. G. O. Ellis, Capt. G. M. Gibbs, March 3rd; Capt. H. Abbott, M.B.E., March 6th; Maj. E. E. Rolfe, March 8th; Capt. P. L. R. Fraser, March 14th; Maj. (actg. Lt.-Col.) S. S. Kennedy, O.B.E., March 15th; Capt. H. B. Dresser, March 16th; Maj. S. Flower, Sec. Lt. (Hon. Lt.) (actg. Capt.) C. Trenchard, Capt. (actg. Maj.) Ward-Browne, O.B.E., M.C., March 21st; Lt. (actg. Maj.) C. C. Hartland, March 24th; Maj. F. A. Forde, Lt. (actg. Capt.) A. H. King, March 25th.

Air Ministry, April 4th

R.A.F.—The following temp. appointments are made :—Staff Officers, 2nd Cl.—And to be actg. Majs. while so emptd., if not already holding that rank. (Air).—Maj. A. B. Ennis, Feb. 6th. (Q).—Sec. Lt. (actg. Capt.) W. G. Webber, Nov. 20th, 1918; Capt. R. D. Seddon, March 12th.

Staff Officers, 3rd Cl.—And to be actg. Capts. whilst so emptd. (O.—Lt. H. Pallett, Dec. 21st, 1918. (T.)—Sec. Lt. (Hon. Lt.) G. A. Tilly, March 4th.

Flying Branch.—Lt. G. N. Trace to be actg. Capt. whilst emptd. as Capt. (A. and S.), March 7th; Sec. Lt. L. J. Betts (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt. (A.), Oct. 26th. (Substituted for the notification in "Gazette," Feb. 14th; F/Cadet 110288 E. H. Simmons is granted a temp. commn. as Sec. Lt. (a.), Sept. 12th, 1918; S. F. Fuller (late, Middx. R. Spec. Res.) is granted a temp. commn as Sec. Lt. (Observer Officer), July 31st, 1918, and to be Hon. Lt.

The following relinquish their commns. on ceasing to be emptd. :—Sec. Lt. I. K. Bell (Can. Engrs.), Dec. 11th, 1918; Sec. Lt. J. Collins (Rf. Bde.), Feb. 26th; Lt. (actg. Capt.) F. V. Robinson, D.F.C. (Sask. R.), Feb. 28th; Lt. H. W. Higham (Lt., Notts and Derby. R.), Lt. R. A. Varley (Lt., N. Staffs R.), March 3rd; Sec. Lt. (Hon. Lt.) C. H. H. C. Cook (Lt., D. of Corn. L.I.), March 7th; Lt. B. H. Smyth (Lt., Glouc. R.), March 8th; Lt. O. A. Rowan (Lt., B. Col. R.), March 27th.

The following are transferred to unemptd. list :—Sec. Lt. A. Schofield, Jan. 8th; Lt. R. Morley-Kyrle, Jan. 11th; Sec. Lt. R. F. Stewart, Jan. 14th; Sec. Lt. H. A. O'Donnell, Jan. 15th; Lt. D. L. N. Eskell, Sec. Lt. P. S. Parkin, Sec. Lt. L. G. Stockwell, Jan 17th; Sec. Lt. G. Parsons, Lieut. A. Pickin, Lieut. L. W. Hibbert, Sec. Lt. J. S. H. Pile, M.C., Sec. Lieut. W. H. Samuel, Jan. 18th; Sec. Lieut. A. King, Jan. 19th; Sec. Lt. H. T. W. Symes, Jan. 20th; Sec. Lt. J. Smith, Jan. 22nd; Capt. R. M. Wynne-Eyton, Jan. 23rd; Sec. Lt. J. A. Sweetlove, Lt. J. W. Turner, Jan. 24th; Sec Lt. P. F. R. Tapley, Jan 25th; Capt. R. J. Paull, Sec. Lt. E. A. Fowrie, Sec. Lt. T. H. Southern, Jan. 27th; Sec. Lt. S. S. Snelling, Lt. C. W. Smith, Lt. F. M. Squires, Jan. 28th; Sec. Lt. H. Oates, Lt. H. K. Spoonley, Lt. W. K. Swayze, Sec. Lt. N. V. Scott, Jan 29th; Capt. J. Wilson, Jan. 30th; Sec. Lt. (Hon. Lt.) R. J. V. Pulvertaft, Jan. 31st; Lt. C. A. Pike, Sec. Lt. E. V. Smith, Feb. 1st; Lt. (actg. Capt.) E. J. Smith, Lt. C. Saunders, Lt. J. A. Strugnell, Feb. 2nd; Lt. L. H. Sutton, Sec. Lt. T. H. Seymour, Feb. 3rd; Sec. Lt. G. A. King, Lt. A. A. Powell, Lt. (actg. Capt.) W. T. Price, M.C., Lt. R. F. Stevens, Lt. J. A. Stronach, Sec. Lt. J. N. Watt, Feb. 5th; Lt. W. Atkinson, Sec. Lt. G. A. O'Sullivan, Sec. Lt. A. G. Pryke, Lt. W. B. Pilling, Sec. Lt. J. Shaw, Lt. J. S. Sneddon, Capt. G. J. Scott, D. F. C., Sec. Lt. C. Stark, Lt. H. C. Stephens, Feb. 5th, Sec. Lt. W. G. Olding, Lt. W. R. F. Stokes, Sec. Lt. T. Stockdale, Lt. W. T. H. Shutt, Feb. 10th; Lt. A. Sherwood, Lt. (actg. Maj.) H. T. Shaw, Lt. J. Skinner, Lt. J. D. Scott, Feb. 7th; Lt. R. H. Gast, Sec. Lt. R. C. Hatcher, Sec. Lt. C. H. Osborne, Lt. (actg. Capt.) E. Pybus, M.C., Lt. R. Scoon, Lt. C. S. Scobie, Capt. A. M. Swyny, Lt. J. E. Sitch, Sec. Lt. S. A. Slater, Lt. R. H. Saundy, Lt. W. E. Watt, Feb. 8th; Lt. S. L. Symondson, Sec. Lt. H. Sharp, Lt. W. Sharp, Feb. 10th; Lt. E. J. D. Sambrook, Lt. A. Sykes, Lt. A. Porter, Sec. Lt. F. Powell, Lt. (actg. Capt.) A. C. Sharwood, Sec. Lt. A. T. Streeter, Sec. Lt. I. McC. Scott, Sec. Lt. J. A. Simson, Sec. Lt. W. A. Scarlett, Feb. 11th; Lt. Dr. H. Ogden, Sec. Lt. F. N. Pickford, Lt. W. M. Pierce, M.C., Sec. Lt. F. L. Stransward, Feb. 14th; Lt. L. H. Pearson, Lt. C. Sneyd, Lt. (actg. Maj.) H. G. Thwaites, Lt. J. Skinner, Lt. J. D. Scott, Feb. 7th; Lt. R. H. Gast, Sec. Lt. R. C. Hatcher, Sec. Lt. C. H. Osborne, Lt. (actg. Capt.) E. Pybus, M.C., Lt. R. Scoon, Lt. C. S. Scobie, Capt. A. M. Swyny, Lt. J. E. Sitch, Sec. Lt. S. A. Slater, Lt. R. H. Saundy, Lt. W. E. Watt, Feb. 8th; Lt. S. L. Symondson, Sec. Lt. H. Sharp, Lt. W. Sharp, Feb. 10th; Lt. E. J. D. Sambrook, Lt. A. Sykes, Lt. A. Porter, Sec. Lt. F. Powell, Lt. (actg. Capt.) A. C. Sharwood, Sec. Lt. A. T. Streeter, Sec. Lt. I. McC. Scott, Sec. Lt. J. A. Simson, Sec. Lt. W. A. Scarlett, Feb. 11th; Lt. Dr. H. Ogden, Sec. Lt. F. N. Pickford, Lt. W. M. Pierce, M.C., Sec. Lt. F. L. Stransward, Feb. 14th; Lt. L. H. Pearson, Lt. C. Sneyd, Lt. (actg. Maj.) H. G. Thwaites, Lt. J. Skinner, Lt. H. Steels, Lt. J. C. P. Sibbering, Feb. 15th; Sec. Lt. N. F. S. Hubbard, Sec. Lt. C. Polk, Sec. Lt. J. T. Sorley, Feb. 14th; Sec. Lt. A. Bent, Lt. R. J. Donaldson, Sec. Lt. C. M. W. Elliott, Lt. J. S. Geddes, Sec. Lt. J. G. Osborne, Lt. H. O'Connor, Sec. Lt. R. K. Pollard, Sec. Lt. T. D. Shaw, Lt. B. Smith, Sec. Lt. H. J. Smith, Feb. 15th; Lt. T. Porritt, Sec. Lt. H. Pyke, Lt. H. L. Stevens, Sec. Lt. W. Southworth, Sec. Lt. A. Sorley, Sec. Lt. E. A. Wadsworth, Feb. 16th; Lt. D. H. King, Sec. Lt. P. H. Perkins, Lt. E. Scadding, Feb. 17th; Sec. Lt. F. R. Eveleigh, Sec. Lt. C. A. Overbury, Sec. Lt. C. H. Phillips, Lt. J. S. Smith, Lt. T. M. Sturgess, Sec. Lt. J. Seed, Lt. J. D. Stewart, Sec. Lt. C. O. Shelswell, Sec. Lt. P. W. Sleigh, Lt. (actg. Capt.) M. G. W. Stewart, D.F.C., Sec. Lt. A. K. Smith, Feb. 18th; Sec. Lt. E. Archer, Sec. Lt. J. B. Edwards, Lt. F. Scarborough, Capt. C. H. Saunders, Sec. Lt. C. G. Strange, Lt. V. N. F. Surtees, Capt. G. G. Speight, Lt. (actg. Capt.) H. Slingsby, A.F.C., Lt. L. H. Streten, Sec. Lt. J. Smethurst, Feb. 19th; Sec. Lt. L. V. Evans, Sec. Lt. C. H. Sinclair, Lt. (actg. Capt.) A. C. Kiddie, Lt. (actg. Capt.) S. N. Pike, D.F.C., Lt. P. W. Plant, Sec. Lt. C. J. Shutz, Lt. A. Shallcross, Lt. C. N. Silvester, Lt. C. P. Stewart, Feb. 20th; Lt. C. A. Sutcliffe, Sec. Lt. J. M. Sleigh, Feb. 22nd; Lt. A. A. Shaw, Lt. S. E. Storrar, Lt. A. E. Simpson, Feb. 23rd; Lt. J. L. Ellis, Lt. R. J. Kirkland, Capt. D. Halstowe, Lt. J. H. Peters, Capt. H. E. Scoones, Sec. Lt. H. F. Shrimpton, Sec. Lt. A. G. Squire, Feb. 23rd; Sec. Lt. (Hon Lt.) (actg. Lt.) H. S. Starkey, Lt. D. G. Powell, Lt. D. T. Steeves, Feb. 24th; Lt. H. E. G. Bowen, Sec. Lt. G. T. Porter, Lt. R. F. Power, Sec. Lt. J. C. Sanders, Sec. Lt. W. R. Souter, Lt. (Hon. Capt.) H. E. Smith, Lt. W. B. Stead, Lt. H. Stubbs, Sec. Lt. H. C. Shires, Sec. Lt. H. J. Tinker, Feb. 25th; Lt. C. Evans, Sec. Lt. M. Owen, Sec. Lt. S. J. Osborne, Sec. Lt. C. W. Phillips, Sec. Lt. A. Shrives, Feb. 26th; Sec. Lt. J. Pugh, Lt. D. D. Phillips, Sec. Lt. (Hon. Lt.) P. Pickering, Sec. Lt. C. Sunderland, Lt. F. J. Suckling, Lt. L. C. Sherfield, Sec. Lt. A. Sharp, Sec. Lt. A. Hon. Lt. H. Perry, Feb. 27th; Sec. Lt. J. P. Elliott, Maj. H. B. Pryor, Sec. Lt. F. Pyle, Sec. Lt. F. H. Symon, Lt. T. H. Scanlon, Sec. Lt. O. M. Smith, Lt. J. V. Southon, Feb. 28th; Sec. Lt. J. N. Kier, Lt. (Hon. Capt.) G. H. Pitt, Sec. Lt. A. R. Pratt, Lt. (actg. Capt.) R. O. Parry, Sec. Lt. R. D. Stewart, Lt. T. S. Seymour, Lt. (actg. Capt.) W. B. Stead, Lt. A. Shirley-Smith, Sec. Lt. A. Whitehead, March 1st; Sec. Lt. R. H. Cornes, Lt. H. G. Freeman, Sec. Lt. H. Knight, M.C., Sec. Lt. E. F. Oakes, Lt. C. J. Partington, Lt. R. W. Peat, Lt. G. L. Pollard, Lt. L. A. T. Strange, Lt. A. M. Sutherland, Lt. W. A. Strickland, Lt. W. V. Skall, March 2nd; Sec. Lt. T. S. Benson, Sec. Lt. A. H. Murison, Lt. H. H. Morris, Sec. Lt. H. Perry, Sec. Lt. J. P. Sharp, Sec. Lt. A. Shand, Lt. (Hon. Capt.) G. N. Wales, (Welsh R., T.F.), March 3rd; Sec. Lt. L. J. Betts, Lt. A. Boldison, Sec. Lt. L. R. Harvey, Sec. Lt. A. M. Murray, Sec. Lt. A. E. Potter, Lt. I. A. Peers, Capt. F. Sharp, Lt. J. R. Samuel, Lt. J. L. Smith, Lt. H. S. Selves, Sec. Lt. (Hon. Lt.) H. G. Strange, Sec. Lt. T. H. Shield, Sec. Lt. R. Somervillson, Sec. Lt. A. Sharpe, Sec. Lt. G. J. Williams, March 4th; Lt. R. M. Burnand, Lt. K. F. Berry, Sec. Lt. J. G. Barrett, Capt. C. C. Brill, Sec. Lt. G. W. Moore, Lt. P. C. Michell, Lt. H. Mitchell, Sec. Lt. J. C. Paterson, Lt. J. R. Piggott, Sec. Lt. R. W. Payne, Capt. T. S. Sharpe, D.F.C., Lt. (Hon. Capt.) O. T. Sloan, Lt. H. Soulsby, Sec. Lt. A. Stevens, Sec. Lt. G. P. Seeley, March 5th; Lt. (actg. Capt.) D. Coates, Sec. Lt. E. H. Firth, Lt. T. G. Fawcett, Sec. Lt. E. E. Gowing, Lt. L. J. F. Muncey, Sec. Lt. G. K. Mills, Sec. Lt. G. C. Mitchell, Lt. L. Murray-Stuart, Lt. H. C. Orpen, Lt. L. T. Onslow, Lt. L. B. Palmer, Sec. Lt. K. H. Paine, Sec. Lt. L. C. Pitts, Sec. Lt. E. M. Patterson, Sec. Lt. E. M. Pearson, Sec. Lt. W. L. W. Potter, Sec. Lt. J. Pratt, Sec. Lt. H. G. Ricketts, Sec. Lt. C. F. Sutton, Lt. J. H. Solomon, Sec. Lt. W. A. Smith, March 7th; Lt. C. D. Bremner, Sec. Lt. T. G. Bird, Sec. Lt. P. G. G. Bacon, Sec. Lt. A. R. Ellwood, Sec. Lt. P. G. Kinz, Sec. Lt. R. L. Kingham, Sec. Lt. W. R. Kelley, Lt. G. Peach, Lt. R. C. Spence, D.F.C., Lt. A. D. Storey, Sec. Lt. J. R. Stewart, Maj. S. V. Sippe, D.S.O., O.B.E., March 8th; Capt. (actg. Maj.) O. M. Ayrton, Sec. Lt. J. V. Blandford, Sec. Lt. W. Blackhurst, Lt. B. C. Pearson, Lt. J. G. Sharp, M.C., Lt. (actg. Capt.) W. A. Southey, D.F.C., March 9th; Shenan, Sec. Lt. T. D'A. Nassau, Lt. H. W. Oliver, Sec. Lt. E. L. Gilbert, Lt. E. Biggs, Lt. H. J. Greenwood, M.C.,

B. Spurgeon, March 11th; Sec. Lt. B. L. Cook (substituted for notification in "Gazette," Feb. 28th); Lt. E. T. Molyneux, Lt. E. R. Owen, Sec. Lt. W. A. B. Pepper, Sec. Lt. R. H. Palmer, Sec. Lt. C. F. Steventon, Lt. M. N. F. Smith, March 12th; Lt. A. Buchanan, Sec. Lt. J. K. Best, Sec. Lt. J. C. Gunn, Lt. C. A. K. Shum, Sec. Lt. (Hon. Lt.) F. W. Smith, D.F.C., March 13th; Sec. Lt. A. W. C. Bayes, Sec. Lt. J. W. Brown, Sec. Lt. C. W. Binet, Lt. G. Dymore-Brown, Sec. Lt. J. G. Dugdale, Sec. Lt. R. P. Dennistoun, Sec. Lt. H. H. Lewis, Lt. (actg. Capt.) R. McLaughlin, D.F.C., Lt. G. H. Fatman, Lt. R. T. Pank, Sec. Lt. B. Schooling, Sec. Lt. T. W. Sheppard, Lt. H. G. Spearpoint, Sec. Lt. A. Sculthorpe, Lt. W. C. Taylor, March 14th; Lt. A. Binnie, M.C., Lt. L. J. Bennett, Sec. Lt. W. G. A. Freke, Sec. Lt. C. W. Miller, Lt. T. H. Newsome, Sec. Lt. C. Parker, Capt. C. E. Roach-Smith, Sec. Lt. C. J. Swatridge, Lt. W. J. Saunders, March 15th, Sec. Lt. F. E. Donkin, Lt. J. E. Philpott, March 16th; Lt. J. Bradbury, Lt. A. E. Evans, Sec. Lt. T. S. Mobey, Lt. C. M. Moore, Sec. Lt. A. J. M. Ozmond, Lt. E. P. Pycroft, Sec. Lt. G. F. Sharp, Lt. W. H. Shrimpton, Sec. Lt. H. W. G. Triggs, Lt. H. B. Turner, Lt. H. E. Wood, (Bord. R.), March 17th; Sec. Lt. F. Buckle, Lt. F. Curtis, Capt. H. H. Dabbs, Lt. W. F. Ogilvy, Sec. Lt. J. W. Richards, Capt. C. B. Sproatt, D.S.C., Sec. Lt. (Hon. Lt.) R. F. Shutes, March 18th; Lt. A. E. Gardiner, Sec. Lt. S. V. Pearce, Sec. Lt. E. Priest, A.F.C., Sec. Lt. A. C. Pring, Sec. Lt. A. R. Rimmer, Sec. Lt. E. C. Roberts, Sec. Lt. W. L. Roblon, Sec. Lt. G. H. Stephenson, Sec. Lt. F. Smith, March 19th; Sec. Lt. M. J. Aslin, Lt. F. A. Baker, Sec. Lt. D. W. Bridge, Sec. Lt. (Hon. Capt.) R. S. Hellier, D.F.C., Lt. L. Nicholson, Lt. W. J. Pullen, Sec. Lt. G. E. T. Payne, Sec. Lt. E. C. Robbins, Lt. O. Sherwood, Sec. Lt. H. Saunders, Lt. (actg. Capt.) I. Welby, M.C., March 20th; Lt. F. C. Auglagnier, Lt. W. A. Ashworth, Lt. H. G. Bradshaw, Sec. Lt. S. Brace, Sec. Lt. V. C. S. Bach, Sec. Lt. J. C. Bowie, Sec. Lt. H. N. Davis, Capt. D. W. Forshaw, Capt. (actg. Maj.) W. S. Huxley, Sec. Lt. H. V. Irving, Lt. A. J. Jewell, Sec. Lt. P. James, Lt. J. A. Manners-Smith, Sec. Lt. H. G. Marsay, Lt. J. Milton, Sec. Lt. A. R. A. Millar, Lt. N. A. MacFarlane, Sec. Lt. F. B. Peacock, Sec. Lt. L. F. Rowsell, Sec. Lt. M. W. C. Ridgeway, Lt. J. N. Rookledge, Lt. L. G. Ward, March 21st; Sec. Lt. H. Bell, Lt. E. Lain, D.C.M., Lt. J. H. Calvert, Lt. C. G. Clark, Sec. Lt. B. Heaton, Maj. (actg. Lt.-Col.) G. L. P. Henderson, M.C., Sec. Lt. J. H. L. Kerby, Capt. (actg. Maj.) J. G. Struthers, D.S.C., Sec. Lt. A. Syddall, Sec. Lt. R. Scarterfield, Sec. Lt. H. D. Thornton, Sec. Lt. G. K. Wood, March 22nd; Lt. T. Aldous, Lt. W. V. F. A. Bolard, March 24th; Sec. Lt. S. Brierley, Lt. I. G. Fleming, Sec. Lt. W. M. Hodgson, Lt. A. W. Miller, March 24th; Sec. Lt. N. G. Breeze, Lt. E. A. V. Ellerbeck, Lt. G. E. Francis, Sec. Lt. D. McKellar, Lt. V. G. Snyder, Lt. G. M. Smith, Sec. Lt. W. H. Tresham, Lt. F. O. Woodman, M.C., March 25th; Sec. Lt. R. N. Bell, Sec. Lt. G. W. Hills, Sec. Lt. (Hon. Lt.) J. Lain, D.C.M., March 26th; Lt. J. F. Foster, Sec. Lt. J. F. Gaffrey, Capt. H. M. Goode, Lt. R. H. Stone, March 27th; Sec. Lt. J. A. Addison, March 29th; Sec. Lt. L. C. Battle, April 4th.

The following relinquish their commns. on account of ill-health caused by wounds, and are permitted to retain the rank of Capt.:—Capt. J. S. Dunkerley, Lt. (actg. Capt.) F. J. Davies, D.F.C., April 5th.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—J. S. Abel (contracted on active service), C. H. Brown (caused by wounds), A. T. Croucher (contracted on active service), C. N. Hosken, April 5th.

Health contracted on active service, and are permitted to retain their

The following Sec Lts. relinquish their commns. on account of ill-rank:—R. W. Brigstock, W. T. Davies, April 5th.

Sec. Lt. J. L. Boyd is antedated in his appointment as Sec. Lt. (A.), Aug. 23rd, 1918.

The antedate of Sec. Lt. W. R. Allison is May 10th, 1918, and not as stated in "Gazette," March 7th.

The initials of Capt. (actg. Maj.) C. J. Clayton, D.F.C., are as now described, and not as stated in "Gazette," March 11th.

The surname of Lt. T. S. Millar is as now described, and not as stated in "Gazette," Dec. 31st, 1918.

Administrative Branch.—Maj. (actg. Lt.-Col.) F. V. H. Mackenzie to be Maj. from (S.O.), and relinquishes the actg. rank of Lt.-Col., Feb. 1st.

Capts. to be actg. Majs. whilst empld. as Majs.:—W. R. C. Dacosta, from (A.), Oct. 30th, 1918; C. Hodgkinson-Smith, from (S.O.), March 10th.

R. G. Staveley-Dale (temp. and actg. Capt., R.A.) is granted a temp. commn. as Capt., Oct. 21st, 1918, seny. from April 1st, 1918.

Lts. to be actg. Capts. while empld. as Capts.:—H. F. J. Capelli, Sept. 30th, 1918; N. M. Hoskins, from (K.B.), Feb. 13th.

The following Lts. (actg. Capts.) relinquish the actg. rank of Capt.: H. D. Duncan, L. H. Hall, D. F. B. Shipwright, C. H. Stonham, March 1st.

Lts. (A.) to be Lts.:—A. Dawes, A. B. C. Harrison, M.C., Nov. 1st, 1918; W. A. Brown, Nov. 3rd, 1918; T. M. Nicholl-Carne, Nov. 12th, 1918; W. Green, Nov. 19th, 1918; J. B. Lawton, Dec. 14th, 1918; G. — Du Cros, Jan. 14th; M. J. D. Mare-Montembault, Jan. 5th; J. L. Des Lauriers, Jan. 6th, J. H. Baring-Gould, Jan. 16th; J. Bremner, Feb. 1st; E. M. Milling, Feb. 11th; G. A. Kinmont, Feb. 27th.

Lt. W. E. Giffard to be Lt., from (K.B.), March 1st.

Lts. (O.) to be Lts.:—O. F. Norton, Nov. 1st, 1917; V. C. Baker, Jan. 2nd; C. B. Burton, Jan. 9th; R. B. Lane, Feb. 10th; A. Impey, Feb. 24th; C. B. Holland, March 1st.

W. Blake (Lt. and Qmr., Gen. List) is granted a temp. commn. as Lt., April 1st, 1918.

Sec. Lt. W. L. Roblon to be actg. Lt. while empld. as Lt., from (A.), Dec. 6th, 1918.

Sec. Lts. to be Sec. Lts., from (A.):—W. Schaefer, Jan. 21st; L. C. Phippen, Jan. 29th; G. Lovett, Feb. 12th; F. G. Urmston, Feb. 10th; C. E. Thorpe, Feb. 24th; R. J. Searle, Feb. 25th; J. B. Raymond, March 3rd; A. E. Buckingham, March 5th.

Sec. Lt. A. J. Poole to be Sec. Lt., from (A. and S.), Jan. 6th, and to be Hon. Lt.

Sec. Lt. S. V. Annis to be Sec. Lt., from (K.B.), March 3rd.

Sec. Lts. to be Sec. Lts., from (O.):—N. F. Penruddocke, Dec. 10th, 1918, and to be Hon. Lt.; B. Shaw, Jan. 22nd; W. Hagan, Feb. 25th; A. B. Poel, Feb. 26th; A. Troth, W. Haviland, Feb. 27th.

Sec. Lt. (Hon. Lt.) C. C. Duffield to be Sec. Lt., from (T.), Oct. 2nd, 1918, and to be Hon. Lt.

Sec. Lt. I. P. Kirk (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt., May 8th, 1918.

Lt. F. Dransfield (R.N.R.) relinquishes his commn. on ceasing to be empld., Jan. 24th.

The undermentioned are transferred to unempld. list:—Capt. (actg. Maj.) C. G. Tosswell, Jan. 2nd; Lt. (actg. Capt.) E. A. Phillipni, Jan. 11th; Sec. Lt. (actg. Lt.) W. I. Prothero, Jan. 13th; Capt. C. J. Temperley, Jan. 17th; Lt. F. G. Steel, Jan. 18th; Sec. Lt. J. W. Pegg, Jan. 22nd; Lt. J. H. Thorpe, Jan. 23rd; Sec. Lt. J. E. Prize, Jan. 24th; Lt. A. G. Platt, Sec. Lt. (Hon. Lt.) A. G. Thomson, Jan. 25th; Sec. Lt. A. Egerton-Savory, Lt. D. F. Stiven, Jan. 26th; Lt. H. Morley, Sec. Lt. (actg. Lt.) F. V. Plant, Capt. G. J. Pickthall, Sec. Lt. C. C. Pilkington, Lt. A. Swinglehurst, Jan. 29th; Sec. Lt. F. A. Owgan, Sec. Lt. W. H. Osborne, Lt. (actg. Capt.) J. M. Ogden, Sec. Lt. J. Sadler, Jan. 30th; Sec. Lt. H. Seely, Feb. 1st; Lt. C. B. Stenning, Feb. 2nd; Capt. G. R. Pollard, Sec. Lt. C. M. Tregurtha, Feb. 3rd; Sec. Lt. (Hon. Lt.) C. S. Preston, Sec. Lt. P. C. Stewart, Feb. 4th; Sec. Lt. J. R. Staup, Sec. Lt. J. P. Smith, Lt. F. L. Simmons, Feb. 5th; Lt. J. A. Stedman, Maj. W. Stormont, Feb. 6th; Sec. Lt. (actg. Lt.) A. M. Oram, Sec. Lt. A. Piercy, Sec. Lt. H. C. Stanley, Feb. 8th; Sec. Lt. C. R. B. Ogden, Sec. Lt. (actg. Lt.) G. F. Peirson, Sec. Lt. J. F. Pile, Sec. Lt. S. McL. Sclanders, Feb. 11th; Sec. Lt. W. L. Pinder, Sec. Lt. J. H. G. Pycroft, Sec. Lt. W. Scott, Sec. Lt. J. P. Smith, Capt. R. H. Stainforth, Feb. 12th; Sec. Lt. E. L. Reynolds, Feb. 13th; Lt. H. Wear, Sec. Lt. E. B. Pim, Sec. Lt. B. T. Piper, Sec. Lt. H. L. Smith, Feb. 14th; Lt. (Hon. Maj.) C. W. Soden, Sec. Lt. A. Sommerfelt, Feb. 15th; Lt. G. W. Powell, Sec. Lt. C. Sugarman, Sec. Lt. H. B. Stubbs, Feb. 16th; Lt. K. G. Sampson, Feb. 18th; Sec. Lt. (actg. Lt.) W. Spink, Feb. 19th; Sec. Lt. R. P. Squire, Feb. 20th; Lt. D. M. Finkerson, Sec. Lt. J. D. Russell, Feb. 23rd; Sec. Lt. R. J. Kirby, Feb. 25th; Sec. Lt. F. W. Furnell, Sec. Lt. (actg. Lt.) R. Swan, Feb. 26th; Sec. Lt. (actg. Lt.) H. W. J. Stone, Sec. Lt. R. E. Southcott, Feb. 27th; Lt. C. B. Millett, Lt. E. J. Stedman, Feb. 28th, Sec. Lt. R. A. Smith, Lt. (actg. Capt.) D. W. Small, March 1st; Sec. Lt. E. O. Byam, Sec. Lt. G. F. Baker, Sec. Lt. (actg. Capt.) D. G. Pike, March 3rd; Sec. Lt. C. Oakley, Sec. Lt. A. B. Stanley, Lt. (actg. Capt.) R. G. Tudor-Jones, March 5th; Lt. J. Powell, Sec. Lt. R. F. Sheldrake, March 6th; Sec. Lt. H. L. Pitt, Sec. Lt. W. J. Scaplehorn, Sec. Lt. W. P. Sutherland, Lt. J. W. Shaw, March 7th; Lt. C. W. Pallister, Lt. G. K. D. Simmons, Lt. H. Slanes, March 8th; Lt. H. A. Bywell, Sec. Lt. C. E. Jones, Sec. Lt. H. E. Shaw, Sec. Lt. D. W. J. Swanston, Sec. Lt. H. C. Stevens, March 9th; Sec. Lt. J. B. Donaldson, Sec. Lt. W. M. Mullins, March 10th; Sec. Lt. J. Oakes, Sec. Lt. J. Potts, Sec. Lt. P. A. Shaw, March 11th; Sec. Lt. W. A. Booth, Sec. Lt. S. Beaumont, Sec. Lt. A. C. Bishop, Sec. Lt. T. M. O'Neill, Sec. Lt. S. V. Proudfoot, March 12th; Capt. N. J. Bell, Sec. Lt. A. A. Pilcher, Lt. R. Speers, Lt. G. F. Scammell, March 13th; Sec. Lt. V. M. Evans, Sec. Lt. W. C. Griffiths, Sec. Lt. R. P. Smillie, Sec. Lt. (actg. Lt.) H. S. Snead, Sec. Lt. K. E. Tulloch, March 14th; Lt. N. M. Smith, March 15th; Lt. J. L. Batstone, Sec. Lt. H. Entwistle, Maj. G. F. Herron, Capt. S. E. Ould, Lt. (actg. Capt.) W. G. Ward, March 21st; Sec. Lt. J. L. Turner, Lt. (actg. Capt.) A. McC. Wilson, March 17th; Sec. Lt. F. P. Miller, Lt. B. H. Rook, Lt. (Hon. Capt.) H. C. Stanley, March 18th; Sec. Lt. J. Nelson, Sec. Lt. H. R. C. Piercy, Sec. Lt. E. Rose, Sec. Lt. R. T. Raw, March 19th; Sec. Lt. D. S. Carrie, Lt. J. R. Fuller, Sec. Lt. H. G. Holman, Sec. Lt. A. A. Hoffman, March 21st; Sec. Lt. W. A. Catford, Sec. Lt. R. Clarke, Lt. R. L. Nicholson, Sec. Lt. V. W. A. Harsent, Sec. Lt. E. R. Law, March 22nd; Lt. P. L. Bolton, M.C., Lt. W. G. Breen-Turner (R. Wel. Fus.), Sec. Lt. A. N. Berry, Sec. Lt. (Hon. Lt.) (actg. Lt.) R. L. Hubball, Capt. W. O. Thomas, M.C., March 23rd; Sec. Lt. W. A. Marshman, Lt. (actg. Capt.) R. Richards, March 24th; Sec. Lt. L. J. Fish, Sec. Lt. (actg. Maj.) R. H. W. Hopkins, Lt. T. K. Russell, March 25th; Sec. Lt. W. Farquharson, March 26th.

Sec. Lt. A. J. F. Critchel relinquishes his commn. on account of ill-health and is permitted to retain his rank, April 5th.

Technical Branch.—Capts. to be Majs. (temp.):—F. R. Arthur, from (Aid.), March 19th; E. Cox, from (S.O.), March 16th.

Granted temp. commns. as Capts. (Grade A.) with seny. from April 1st, 1918:—L. H. M. Bennett (Lt. R.N.V.R.), July 24th, 1918; A. Richard (Lt. R.N.), Jan. 6th.

Lt. S. J. Gardiner to be Lt. (Grade A.) from (A.), March 14th.

Sec. Lt. C. V. Ambler, D.F.C., to be actg. Lt. (Grade A.) from (O.), whilst empld. as Asst. Instr., Oct. 28th, 1918 (substituted for notification in "Gazette," of Feb. 14th.

Sec. Lt. J. J. Shuley to be Sec. Lt. (Grade B.), from (Ad.), Oct. 1st, 1918.

Sec. Lt. C. H. Bunn (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt. (Grade A.), Dec. 1st, 1918 (substituted for notification in "Gazette" of March 28th).

The following are transferred to unempld. list:—Sec. Lt. G. S. Orr, Jan. 15th; Lt. (actg. Capt.) H. Jan. 23rd; Lt. J. P. Sadler, Jan. 24th; Sec. Lt. (Hon. Lt.) T. Parker, Sec. Lt. E. Sparshott, Jan. 25th; Sec. Lt. A. H. Bull, Lt. E. C. Pole, Lt. R. F. Sinclair, Capt. A. Sowden, Jan. 26th; Sec. Lt. (actg. Lt.) D. Oliver, Jan. 27th; Lt. J. L. Smith, M.C., Jan. 28th; Lt. A. C. Sturney, Sec. Lt. J. Hart, Jan. 29th; Lt. A. W. Osman, Sec. Lt. J. V. Squire, Capt. W. S. Stacey, Feb. 1st; Sec. Lt. (Hon. Maj.) (actg. Capt.) H. L. Coles, Lt. E. Piggott, Feb. 2nd; Lt. (Hon. Maj.) (actg. Capt.) H. L. Stradling, Feb. 3rd; Capt. A. Kennedy, Capt. E. S. Perrin, Capt. (actg. Maj.) W. W. Stenning, Lt. C. H. O. Stanton, Lt. C. E. Tebbs, Feb. 4th; Lt. (actg. Lt.) W. H. Spann, Feb. 15th; Sec. Lt. A. E. Simmonds, Feb. 16th; Sec. Lt. R. L. T. Latour, Sec. Lt. A. R. Powis, Sec. Lt. (actg. Lt.) W. H. Wade, Lt. A. D. Simmonds, Feb. 14th; Sec. Lt. A. F. Potter, Feb. 5th; Sec. Lt. J. Opie, Feb. 6th; Sec. Lt. A. F. Potter, Feb. 5th; Sec. Lt. J. Opie, Feb. 6th; Sec. Lt. A. F. Potter, Feb. 11th; Sec. Lt. W. Pope, Lt. A. D. Simmonds, Feb. 14th; Sec. Lt. (actg. Lt.) W. H. Spann, Feb. 15th; Sec. Lt. A. E. Simmonds, Feb. 16th; Sec. Lt. R. L. T. Latour, Sec. Lt. A. R. Powis, Sec. Lt. (Hon. Lt.) D. G. Prentice, Sec. Lt. W. T. Sharp, Feb. 18th; Lt. V. Peck, Feb. 10th; Sec. Lt. A. Stevens, Sec. Lt. H. Sanders, Lt. F. N. Singleton, Capt. W. H. Sayers, (Hon. Lt.) M. D. Scott, Feb. 20th; Sec. Lt. A. E. Kitsell, Sec. Lt. H. T. See, Sec. Lt. W. O. Spinks, Feb. 21st; Sec. Lt. A. O'Sullivan, Lt. H. W. L. Poole, Lt. R. N. Rowell, Feb. 23rd; Sec. Lt. (Hon. Lt.) C. J. Silverston, Feb. 24th; Capt. H. J. Procter, Sec. Lt. (actg. Lt.) J. Smallbone, Feb. 26th; Capt. E. P. Smyth, Feb. 28th; Capt. S. E. Ould, Lt. H. J. Parkes, Lt. L. R. B. Pearce, Sec. Lt. A. Peck, Sec. Lt. (Hon. Lt.) M. A. Shepstone, Lt. (actg. Capt.) G. M. Wingate (Essex R.), March 1st; Sec. Lt. (actg. Lt.) R. T. Sault, March 3rd; Sec. Lt. (actg. Lt.) S. Mills, Capt. R. C. Philpott, Sec. Lt. (actg. Capt.) F. H. Sandy, March 4th; Sec. Lt. J. Shaw, March 5th; Capt. J. C. Mitchell, Lt. (actg. Capt.) R. A. Perrin, Sec. Lt. V. C. Sykes, March 6th; Capt. (actg. Maj.) C. H. Morgan, March 7th; Lt. (actg. March 8th; Lt. R. W. Burnside, Sec. Lt. A. R. Deacon, Sec. Capt.) P. A. Barron, Lt. W. Burnside, Sec. Lt. A. R. Deacon, Sec. Lt. R. W. Ellis, March 8th; Sec. Lt. E. Selley, March 9th; Lt. D. Ottewell, Capt. W. H. Smith, March 10th; Maj. B. J. Ellis, Lt. A. F. Mytton, Lt. B. Paterson, Capt. R. Scammell, Lt. G. Shanks, Sec. Lt. E. W. Shaw, March 11th; Lt. G. E. Osmond, Sec. Lt. E. P. Proud, Lt. E. W. Shaw, March 12th; Sec. Lt. J. Brereton, Sec. Lt. (actg. Lt.) W. Searle, March 13th; Sec. Lt. J. Brereton, Sec. Lt. (Hon. Lt.) G. R. Simpson, M.C., March 14th; Capt. S. A. Bevington, Sec. Lt. (Hon. Lt.) (actg. Lt.) J. P. Bown, Maj. W. C. Byrne, Sec. Lt. E. E. Frankis, Sec. Lt. (Hon. Capt.) H. A. Griffin, March 14th; Lt. J. Booth, Sec. Lt. A. Parsons, Lt. G. H. Stocking, Capt. H. H. Stone, March 16th; Maj. J. Craig, Sec. Lt. H. Samuels, March 17th; Lt. J. V. Cook, Sec. Lt. A. R. Matthews, Maj. R. V. Southwell, Capt. H. L. Saunders, March 19th; Sec. Lt. A. R. McI. Carse, Sec. Lt. A. Kennish, Sec. Lt. S. A. Millard, Lt. (actg. Capt.) F. E. H. Paget, Lt. J. Pearson, Sec. Lt. S. Stocks, March 20th; Lt. G. A. Lush, Sec. Lt. (actg. Capt.) A. Lt. S. P. Stocks, March 20th; Lt. G. A. Lush, Sec. Lt. (actg. Capt.) A. G. F. Nash, Maj. E. B. Palmer, Maj. T. E. Robertson, O.B.E., March 22nd; Sec. Lt. W. C. Bowen, Sec. Lt. A. F. C. Lewns, Lt. (actg. Capt.) W. J. Palmer, Sec. Lt. J. C. Sword, Lt. B. Taplin, March 23rd; Sec. Lt. D. D. Lockwood, Capt. D. A. B. Tonks, March 24th; Capt. R. W. B. Billinghurst, Capt. R. G. Fyfe, Capt. F. Shepherd, Lt. T. H. Scott, March 25th; Sec. Lt. E. C. Aslen, Capt. J. E. Blair, Capt. E. S. McDonald, Sec. Lt. (Hon. Lt.) A. R. Rouse, Lt. H. D. Spratt, March 26th;

Lt. R. C. Crawley, Maj. A. S. Hollawell, O.B.E., Lt. J. McD. Horobin, Maj. B. T. Hamilton, Sec. Lt. G. W. Stephenson, March 27th.

Capt. T. Ridge (R.E.) relinquishes his commn. on account of ill-health, April 5th.

The surname of Sec. Lt. (actg. Lt.) J. Rollo is as now described, and not as stated in "Gazette," March 4th.

The notification in "Gazette," Feb. 7th, concerning Sec. Lt. (actg. Lt.) L. B. Clarkson is cancelled.

MED.CAL BRANCH.—J. Kyle is granted a temp. commn. as Lt., April 2nd.

The following are transferred to unempld. list:—Lt. G. A. Simmons, Feb. 27th; Capt. T. E. Mulvany, March 3rd; Capt. W. L. Scott, March 13th; Capt. A. S. Clegg, March 15th; Capt. (actg. Maj.) H. Stedman, March 20th; Capt. R. G. Maglione, March 21st; Capt. A. L. Bykes, March 25th.

Capt. J. W. Brash (R.A.M.C., Spec. Res.) relinquishes his commn. on account of ill-health, March 1st.

The notification in "Gazette," Nov. 26th, 1918, concerning Capt. H. H. Gelbert is cancelled.

DENTAL BRANCH.—Lt. D. H. W. Williamson to be Capt., Nov. 12th, 1918; Lt. A. E. F. Peaty is transferred to unempld. list, March 11th.

MEMORANDA.—Lt. W. B. Gullen relinquishes his commn. on ceasing to be empld., March 16th.

Lt. R. N. Ball is transferred to unempld. list, March 20th.

The following are transferred to unempld. list from (S.O.):—Lt. C. T. S. Mendl, Feb. 11th; Maj. W. E. Plaister, M.B.E., Feb. 21st; Capt. (actg. Maj.) C. B. Krabbe, March 2nd; Capt. H. Spink, March 6th; Capt. W. A. Daft, Lt. G. Purvis-Russell-Balfour-Kinnear, Maj. Hon. J. H. B. Rodney, M.C. (Rif. Bde.), March 11th; Maj. S. O. Everitt, Lt. (actg. Capt.) L. R. Neville, March 15th; Lt. (actg. Capt.) T. A. Peddell, M.B.E., March 20th; Capt. (act. Maj.) A. H. Parker, M.C., March 21st.

The name of Miss Annie O'Donoghue is as now described, and not as stated in "Gazette" of Feb. 28th.

CORRECTIONS.—Lt. E. P. Kenny, D.F.C., 1st Sqn., Australian Flying Corps, and Royal Air Force (Egypt), awarded the Distinguished Flying Cross in the "London Gazette," of Feb. 8th. The note therein referring to the Military Cross is cancelled, Lt. Kenny has not been awarded that distinction.

Capt. (actg. Maj.) H. I. Hanmer, D.F.C. (S. Staff. R.) (Egypt), awarded the Distinguished Flying Cross in "Gazette" of Jan. 1st, the announcement in "Gazette" of Feb. 8th (award of Distinguished Flying Cross) should accordingly read Bar thereto

Lt. G. Davis, D.F.C., awarded the Distinguished Flying Cross in "Gazette" of Feb. 8th is now correctly described 153rd Squadron, France).

Capt. A. G. A. Davis, A.F.C. (Devon R.), awarded the Air Force Cross in "Gazette" of Jan. 1st, is now correctly described.

No. 13061 Flt. Sgt. T. Nicoll, Royal Air Force, awarded the Albert Medal for gallantry in France on Feb. 26th, 1918, as announced in the "London Gazette" of June 7th, 1918, is now correctly described.

Lt. (actg. Capt.) A. R. Brown, D.F.C., (Aust. F.C.), awarded the D.F. Cross in "Gazette" of Feb. 8th, is now correctly described.

Lt. P. J. McGinness, D.F.C., D.C.M., (Aust F.C.), awarded the D.F Cross in "Gazette" of Feb. 8th, is now correctly described.

Lt. C. E. Channing, A.F.C. (formerly Gunner, R.G.A.), awarded the Air Force Cross in the "Gazette" of Nov. 2nd, 1918, is now correctly described.

WAR OFFICE, April 5th.

His Majesty the King has approved of the award of the Military Medal for bravery in the field to the under-mentioned air mechanic:—

No. 12486 1st Air Mech. James Pierpoint Glasscock, R.A.F. (Croydon), formerly attd. Headquarters 77th Brigade, R.F.A., France.

AIR MINISTRY, April 5th.

His Majesty the King has been graciously pleased to confer the under-mentioned rewards on officers and other ranks of the Royal Air Force in recognition of gallantry in flying operations against the enemy:

AWARDED THE DISTINGUISHED SERVICE ORDER.

Capt. (actg. Maj.) FRANK LUBBOCK ROBINSON, M.C. (R. Innis. Fus.) (Mesopotamia).—A very gallant and able squadron commander who, by his fine leadership and personal example, has raised high the morale of his command. By his untiring energy he has rendered most valuable service on reconnaissance duty and bombing raids (M.C. gazetted Sept. 6th, 1915.)

AWARDED A BAR TO THE DISTINGUISHED FLYING CROSS.

Capt. RONALD DAVIDSON SIMPSON, D.F.C. (A.S.C.). (Mesopotamia.)—An officer conspicuous for his gallantry and devotion to duty. He has rendered exceptionally valuable service when on contact patrol with cavalry, furnishing most important information. He has carried out numerous bombing raids at low altitudes under heavy hostile fire. (D.F.C. gazetted Jan. 1st, 1919.)

AWARDED THE DISTINGUISHED FLYING CROSS.

Lieut. JOHN LESLIE WALTER BACON (Ches. R.). (Mesopotamia). During the last part of the operation this officer displayed marked gallantry and determination, never hesitating to descend to a low height to locate the position of our troops, frequently in face of severe hostile fire. On one occasion he carried out four bombing raids in one day on an objective seventy miles distant.

Lieut. (acting Capt.) ERIC MORRELL COLES. (France.) This officer has taken part in over one hundred successful bombing raids, and has carried out most valuable photographic and reconnaissance work. He has also crashed two enemy aircraft. At all times he displays conspicuous gallantry and an utter disregard of danger.

Sec. Lieut. (Hon. Capt.) HENRY WYNN DEACON (Roy. Arty.). (Mesopotamia.) This officer has shown marked courage and devotion to duty in carrying out reconnaissances of our advanced positions and those of the enemy, often under heavy fire. His reports have invariably been most accurate and detailed, containing most valuable information.

Lieut. (actg. Capt.) GEORGE JONES (Aust. F.C.). (France.) A most daring and gallant leader in aerial fighting, in which he has destroyed seven enemy aircraft. Captain Jones has always displayed marked ability in all his duties.

Lieut. (actg. Capt.) ANDREW MACGREGOR (Arg. and Sutherland Highrs.). (France.) This officer has accounted for five enemy aircraft and has proved himself an exceptionally capable leader of patrols, notably on August 14th, when his formation of five machines were attacked by eight enemy aircraft. By his skilful leadership five of the latter were brought down without his own formation sustaining a single casualty.

Sec. Lieut. GEORGE ROBERTSON MOFFOOT. (Murmansk.) Sec. Lieut. ROBERT BISSET GORDON. (Murmansk.) These officers displayed conspicuous gallantry in a recent bombing raid. While so engaged their engine was hit and the machine eventually crashed. Climbing out, they removed the Lewis gun and set fire to the machine. Before they could make sure that the machine was fully alight they heard parties of the enemy approaching, and they escaped into the woods. After wandering about for two days they met a friendly hunter, who conducted them to our outposts. On reaching our lines these officers had to be admitted to hospital suffering from frost-bitten feet. A fine example of courage and determination.

Capt. (actg. Major) FRANCIS STEELE MOLLER, M.C. (Murmansk.) A Wing Commander of outstanding merit who, by his fine leadership, personal disregard of danger, and splendid example has, since he took over the command of his Wing (composed of one British and two Russian Squadrons) worked marvels in raising its morale and efficiency. His personal influence was very marked on a recent occasion when, owing to heavy casualties, the morale of the pilots had suffered; he took charge, and by his example and leadership restored confidence, and successfully reduced the enemy's artillery fire. (M.C. gazetted Nov. 14th, 1916.)

Lieut. (actg. Capt.) ARTHUR NEWMAN, M.C. (4th Batt., Essex R., T.F.). (France.) A gallant and determined officer who has carried out over one hundred most successful bombing raids, frequently in face of severe hostile fire. He has also destroyed two enemy aircraft, and rendered valuable service on reconnaissance and photographic patrols. (M.C. gazetted June 3rd, 1916.)

AWARDED THE MERITORIOUS SERVICE MEDAL.

(For Services in Mesopotamia.)

28007 Flt. Serjt. J. J. Chester (London, W.).
26251 Serjt. J. Noyce (Whitstone, Devon).
16548 Serjt.-Clk. T. H. Tollfree (Putney, S.W.).
2835 Serjt.-Maj. W. Wood (Dukinfield, Cheshire)

AWARDS OF FOREIGN DECORATIONS.

His Majesty the King has granted unrestricted permission for the wearing of the under-mentioned decorations, conferred on the officers and other ranks indicated, for valuable services rendered in connection with the war:—

CONFERRED BY THE PRESIDENT OF THE FRENCH REPUBLIC.

Croix d'Officier, Legion d'Honneur.

Col. (actg. Brig.-Gen.) Lionel Evelyn Oswald Charlton, C.B., C.M.G., D.S.O. (Lanc. Fus.).

Croix de Chevalier, Legion d'Honneur.

Maj. (actg. Lt.-Col.) Jack Armand Cunningham, D.S.O., D.F.C. (R. Art.).

Capt. (actg. Maj.) Henry William Moncrieff Paul, O.B.E., M.C. (Middx. R.).

Maj. John Percy Claude Sewell.

Lt.-Col. George Eardley Todd (Welsh R.).

Croix de Guerre.

Sec. Lt. William Henry Bland (with Bronze Star).
Sec. Lt. (Hon. Lt.) Fernand Charles Butler, M.B.E. (with Silver Star).
Sec. Lt. William Sheriff Campbell (with Palm).
Maj. Hugh Vivien Champion de Crespigny, M.C., D.F.C. (with Bronze Star).
Sec. Lt. John Raymond Chisman (with Bronze Star).
Maj. (actg. Lt.-Col.) Jack Armand Cunninghan, D.S.O., D.F.C. (with Palm) (R.A.).
Lt. the Hon. John Ernest de Grey Henniker-Major (with Silver Star).
Lt. (actg. Capt.) Francis Ernest John (with Silver Star).
Capt. Arthur Gordon Jones-Williams, M.C. (with Palm).
Sec. Lt. Joseph George Kershaw (with Bronze Star).
Lt. (actg. Capt.) Claude Louis Morley, D.F.C. (with Bronze Star).
Lt. (actg. Capt.) Maurice Ashdown Newnham, D.F.C. (with Palm).
Maj. Ernest William Norton, D.S.C. (with Palm).
Sec. Lt. Donald Oxley (with Bronze Star).
Sec. Lt. George Brooke Pike (with Bronze Star).
Sec. Lt. Horace George Pope (with Bronze Star).
Lt. George Richardson, 65th Wing (with Palm).
Lt. (actg. Capt.) Thomas Rivers (with Silver Star).
Sec. Lt. (actg. Capt.) Richard Russell (with Silver Star).
Capt. Richard Rivers Langslow Thom (with Silver Star).
Lt. (actg. Capt.) Otto Ludwin Vetter (with Silver Star).
Lt. (actg. Capt.) Joseph Leonard Maries White, D.F.C. (with Bronze Star).
142209 Serjt.-Mech. Patrick Hoelihan, 108th Sqdn. (with Bronze Star).
11940 Serjt.-Mech. Edgar Edward Yardy, 38th Sqdn. (with Bronze Star).

DECORATIONS CONFERRED BY HIS MAJESTY THE KING OF ITALY.

Cavaliere of the Order of St. Maurice and St. Lazarus.

Maj. (actg. Lt.-Col.) Ronald Dockray Waterhouse.

Officer of the Order of the Crown of Italy.

Maj. (actg. Lt.-Col.) Edward Raymond Peal, O.B.E., D.S.C.

Cavaliere, Order of the Crown of Italy.

Capt. (actg. Maj.) Archibald Winter Crombie.

The Croce di Guerra.

(Awarded for services rendered in the Mediterranean Area.)

Capt. Sydney Ernest Ball, D.F.C.
Lt. David Royds Birkbeck Bentley.
Capt. (actg. Maj.) Harold John Thomas Berryman.
Lt. Leonard de Ville Chisman.
Lt. Charles Chrimes.
Sec. Lt. Ernest Richard Hiscocks.
Lt. Sidney Knight Forbes Phillip Humphrey.
Lt. (actg. Capt.) Basil Graham Humphrey Keymer, D.F.C.
Lt.-Col. (actg. Col.) Arthur Murray Longmore, D.S.O.
Sec. Lt. James Alexander Munn.
Lt.-Col. Douglas Austin Oliver, D.S.O.
Lt.-Col. Richard Edmund Charles Peirse, D.S.O., A.F.C.
Sec. Lt. Hugh Randle.
Lt. Edmund Guy Spooner.
Capt. Raymond James Filmer Sulivan.
Lt. Gerald Ingram Thorman.
Lt. Frank Wood (225 Sqdn., Adriatic).
No. 208273 Serjt. Kenneth Edwin Dawson.
No. 210629 1st Air Mech. Frank Roland Heckford.

Bronze Medal for Military Valour.

Lt. Basil Townley Anderson.
Lt. Eric Lowe Bragg.
Capt. Edmund Parfitt Hardman, D.F.C.
Lt. Archibald Leslie Huether.
Capt. (actg. Maj.) Reginald Frederick Stewart Leslie, D.S.C., D.F.C.
Lt. Philip Edward Lindner.
Capt. (actg. Maj.) John Stanton Fleming Morrison, D.F.C.
Lt. Grant Raney.
Lt. Cecil Spencer Sivil.
Lt. Stephen Charles Strafford, D.F.C.
222466 Cpl. Frederick Thomas Wallace, D.F.M. (Canning Town, E.)

Conferred by His Majesty the King of the Belgians.

Ordre de la Couronne, Commandeur.

Col. (actg. Maj.-Gen.) Charles Laverock Lambe, C.M.G., D.S.O.

Croix de Guerre (Belgian).

Lt (actg. Capt.) Norman Leslie Carstin, 102 Sqdn.
Lt. Stanley Wightman Mountain, 16 Balloon Sec.

Conferred by His Majesty the King of the Hellenes.

Grand Commandeur de l'Ordre de St. Sauveur.

Maj.-Gen. William Geoffrey Hanson Salmond, C.B., D.S.O., (R.A.).
Lt.-Col. (actg. Brig.-Gen.) Philip Lee William Herbert, C.M.G. (N. and D. R.).

Officier de l'Ordre de St. Sauveur.

Lt.-Col. Carlos Bovill (R.A.).
Lt.-Col. Cecil Fraser, O.B.E., M.C. (N. Staffs.).

Chevalier de l'Ordre de St. Sauveur.

Lt. (actg. Capt.) James John Williamson, A.F.C.

Officier de l'Ordre de Georges 1er.

Maj Keith Riddell Binning, M.C.
Capt. (actg. Maj.) Chaplin Court Treatt (N. Lancs. R.).
Maj. Arthur Claud Wright.

Chevalier de l'Ordre de Georges 1er.

Sec. Lt. Harold Hudson.

Conferred by His Majesty the King of Serbia.

The Order of the White Eagle, 4th Class, with Swords.

Lt.-Col. George Eardley Todd, 16th Wing (Welsh R.).

War Office, April 7th.

The names of the under-mentioned officers are brought to notice for gallant and distinguished service rendered in connection with the military operations at Aden during the period from August 16th, 1917, to Jan. 31st, 1918:—

Royal Air Force

Mann, Lieut. (actg. Capt.) L. J., M.C
Owden, Lt. J. S.
Stodart, Major D. E., D.S.O., D.F.C.

The names of the undermentioned officers are brought to notice for gallant and distinguished service rendered in connection with the military operations at Aden during the period from Feb. 1st, 1918, to August 31st, 1918:—

Royal Air Force.

Knight, Lieut H. F.
Sherwin, Capt. C. E., M.C.

Correction.

The following names were omitted in error from the Air Ministry "Gazette" of March 28th:—

The following are transferred to unemplid list:—Sec. Lt. T. S. Miller, Jan. 25th; Sec. Lt. R. Sharrock, Sec Lt. D. C. Thomas, Jan. 26th.

FROM THE COURT CIRCULAR.

Buckingham Palace, April 3rd.

The following were severally introduced into the presence of the King, when His Majesty invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:—

The Most Excellent Order of the British Empire (Military Division).—Commanders.—Brig.-General Christopher Courtney, R.A.F. (also received the Distinguished Service Order), and Brig.-General Cecil Whittington, R.A.F.

The Distinguished Service Order.—Major Charles Wynne-Eyton, R.A.F.

The Most Excellent Order of the British Empire.—Officer.—Military Division.—Major Stamford Raffles, R.A.F.

The King then conferred decorations as follows:—

The Military Cross.—Capt. Charles Cudemore, R.A.F.; Capt. Ignatius Welby, R.A.F.; Lieut. Ernest Lindup, R.A.F.

Buckingham Palace, April 5th.

The King held an Investiture at 11 o'clock this morning.

His Majesty decorated the following with the Victoria Cross:—

Lieut. Alan Jerrard, R.A.F. When on an offensive patrol with two other officers, he attacked five enemy aeroplanes and shot one down in flames, following it down to within one hundred feet of the ground. He then attacked an enemy aerodrome from a height of only fifty feet from the ground, and, engaging single-handed some nineteen machines, which were either landing or attempting to take off, succeeded in destroying one of them, which crashed on the aerodrome. A large number of machines then attacked him, and whilst thus fully occupied he observed that one of the pilots of his patrol was in difficulties. He went immediately to his assistance, regardless of his own personal safety, and destroyed a third enemy machine. Fresh enemy aeroplanes continued to rise from the aerodrome, which he attacked one after another, and only retreated, still engaged with five enemy machines, when ordered to do so by his patrol leader. Although apparently wounded, this very gallant officer returned repeatedly, and attacked single-handed the pursuing machines, until he was eventually overwhelmed by numbers and driven to the ground. Lieut. Jerrard had greatly distinguished himself on four occasions, within a period of twenty-three days, in destroying enemy machines, displaying bravery and ability of the very highest order.

The King then conferred decorations as follows:—

The Distinguished Service Cross.—Capt. Edward Maitland-Heriot, R.A.F.

The Military Cross.—Capt. Robert Durno, R.A.F.; Lieut. Sydney Harper, Cheshire Regt., attd. R.A.F.; Lieut. Owen Tudor-Hart, R.A.F.

ADMIRALTY APPOINTMENTS.

The following appointments have been made:—

April 3rd.—Surg. Lieut.-Comm.—R. H. W. W. Biddulph, to "Argus," April 2nd.

Payr. Lieuts.—G. Kyrke (temp.), to "Vindictive."

THE CASUALTY LIST.

MILITARY.

Reported April 1st.

Released Prisoners from Germany arrived in England.—Prichard, Capt. F. H., R.F.C.; Trulock, Sec. Lt. J. C., R.F.A., attd. R.F.C.; Joubert de la Ferté, Sec. Lt. J. C., R.F.C., Meakin Sec. Lt. G. E. R., R.F.C.

Australian Imperial Force.

Previously reported Missing, now reported Killed.—Jack, Capt. T., M.C., Aust. F.C.; Jeffers, Lt. J. P., Aust. F.C.; Peel, Sec. Lt. J. C., Aust. F.C.

AIR FORCE.

Reported April 3rd.

Killed.—Ayles, Sec. Lt. W. M. W.
Drowned.—Gallant, Sec. Lt. F. J.
Died.—Atkinson, Capt. R. N. G.
Fisher, Maj. H. F.
Tratman, Lt. L. W. D.
Repatriated.—Davies, Lt. G. L.; Prichard, Capt. F. H.; Richardson, Lt. G. T.

Reported April 4th.

Killed.—Adams, Capt. A. P.
Allen, Sec. Lt. C. A.
Kellough, Sec. Lt. W. R.
Kennedy, Sec. Lt. W.
Died of Injuries.—Kaw, Sec. Lt. W. A.
Died.—Moore, Lt. W. V.
Payne, Maj. S. J.
Sinclair, Lt. R. B.

Casualties among Airmen. The Dates are those of the Official List.

Killed.

April 1st.—Younges 520038 AC/2 H. W. (South Norwood).
April 2nd.—Sparrow 50100 AM/3 A. E. (Accrington).

Died.

April 1st.—Arniel 406781 AC/1 D. (Dunfermline); Bailey 89315 L/AC E. (London); Bain 110630 AC/1 R. T. (Dundee), Curran 201734 AC/2 M. (Waterford); Franklin 93582 AC/2 W. P. D. (Blaistow); Goulding 220851 Cpl. G. M. (Addlestone), Herriott 5245 (L/AC F. (Brighton); Hiatt 268377 AC/2 T. (Smethwick); King 10338 Sit. G. T. (Walworth); Kransgrill 168313 AC/2 F. A. (London); Marshall 290244 AC/2 J. (Drumguin); Philborough 219057 AC/1 A. H. (Walthamstow); Shaw 10349 Sit. F. W. (Cambridge); Walker 258018 Sit. H. (Newtown); Walls 283856 AC/2 T. (Lancaster Gate); Whilton 142412 AC/2 E. R. (Hednesford); Whiteside 277068 AC/2 A. (Bothwell); Williamson 75785 AC/1 H. (Wolverhampton); Woodland 5114 1/AC P. H. (Aylesford).

April 2nd.—Alexander 62741 AC/1 D. W. (Beccles); Bent 8970 Serjt. W. E. (St. Johns Wood, London); Brookes 5487 L/AC A. (Dartford); Bunning 4052 Cpl. F. B. (Droxford); Cheadle 20250 L/AC E. (Burston); Cowell 291526 AC/2 G. B (Old Kent Road, London); Dickinson 21630 AC/1 E. (Wigan); Drinkwater 45490 AC/2 N. (Timperley); Hallam 2447 Serjt. E. L. E. (Sheffield), Hinton 403107 AC/1 W. (Birmingham); Hodges 304951 AC/2 A. J. (Twyford); Lucas 19170 L/AC S. (Worcester); Nalder 55028 AC/1 W. A. (Wolverhote); Osborne 10117 Flt. Serjt. A. C. (Golden Square, London); Smith 4037 L/AC B. W. (Farncombe); Smith 144565 L/AC W. (Liverpool), Stiff 79267 AC/1 G. H. (Bristol); Taylor 67223 AC/1 J. (Pendleton); Tessler 742120 AC/2 G. (Northampton); Webster 29590 L/AC A. E. (Reading).

Repatriated.

April 1st.—Johnston 2458 Cpl. R. (Tillicoultry); Summers 13598 Cpl. W. (Harlesden, N.).

ENLISTMENT IN THE R.A.F.

The Air Ministry forwards the following for publication:—

Enlistment of Demobilised Soldiers in the Royal Air Force.

1. A demobilised soldier, who is desirous of enlisting in the R.A.F., should, in the first instance, apply in writing to the nearest R.A.F. Reception Depot, stating:—

(a) Regimental number. (b) Rank (substantive or acting, as the case may be) he held in the Army immediately prior to demobilisation. (c) Name in full. (d) Corps in the Army. (e) Trade and other qualifications, if any, in the Army. (f) Trade or calling in civil life. (g) Medical category. (h) Home address. (i) If still on demobilisation furlough, date of expiration of furlough.

The following is a list of R.A.F. Reception Depots:—No. 1—40, Upper Brook Street, Mayfair, London, W.1. No. 2—Tyndall's Park Road, Clifton, Bristol. No. 2 (b)—12, Newport Road, Cardiff. No. 3—Carlton Chambers, Paradise Street, Birmingham. No. 3 (a)—George Street, Nottingham. No. 3 (b)—12, Abercromby Square, Liverpool. No. 4 (a)—The Mount, Springfield Mount, Leeds. No. 4 (b)—10, Sydenham Terrace, North Road, Newcastle-upon-Tyne. No. 5—9, Somerset Place, Sonchichall Street, Glasgow.

In the case of a soldier living in Ireland, he should address his application to O.C. No. 3 (b) Reception Depot, Royal Air Force, 12, Abercromby Square, Liverpool.

2 If considered suitable, the applicant will receive a free railway warrant, and orders to report to the Reception Depot named, on a specified date. His final acceptance will be dependent on his passing a medical examination.

In the case of a demobilised soldier who held W.O. or N.C.O. rank, no guarantee can be given him that he will be given corresponding rank in the R.A.F., but everything will depend on R.A.F. requirements, vacancies in establishment, and the man's own suitability for promotion. If he possesses any trade qualifications, he will be permitted to undergo a trade test, and will be mustered to that trade if successful.

3 *Terms of Enlistment in R.A.F.*—The following are the various terms for which demobilised soldiers may at present enlist in the Royal Air Force:—

(a) Approximately two years with the colours—i.e., from date of enlistment to any date between Jan. 1st, 1921, and June 30th, 1921, according to R.A.F. requirements then existing. (b) Approximately three years with the colours—i.e., from date of enlistment to any date between Jan. 1st, 1922, and June 30th, 1922, according to R.A.F. requirements then existing. (c) Approximately four years with the colours—i.e., from date of enlistment to any date between Jan. 1st, 1923, and June 30th, 1923, according to R.A.F. requirements then existing. (d) Four years with the colours, and eight years with the reserve, reckoned from date of enlistment. (e) Six years with the colours, and six years with the reserve, reckoned from date of enlistment. (f) Eight years with the colours, and four years with the reserve, reckoned from date of enlistment.

Those enlisting for either (a), (b), or (c) must do so on or before June 30th, 1919, after which date enlistments may only be for (d), (e), or (f).

4. Demobilised soldiers enlisting in the R.A.F. will be eligible to draw the bonus authorised under A.M.W.Os. No. 163 and No. 164 of 1919, with effect from date of enlistment into R.A.F., in addition to ordinary R.A.F. pay and allowances. Separation allowance will be paid under existing rules and regulations until further notice.

PERSONAL NOTICES.

NAVAL.

Engagement

WHIDDINGTON—GRANT.—The marriage arranged between Major R. Whiddington, D.S.C., M.A., R.A.F. (Fellow of St. John's College, Cambridge), son of Richard Whiddington and Mrs. Whiddington, of 8, Bigwood Road, N.W.4, and Kathie, eldest daughter of Alexander Reoch Grant and Mrs. Reoch Grant, of 3, Bigwood Road, N.W.4, will take place on April 9th.

Marriage.

WRIGHT—COWLES.—On April 5th, at Christ Church, Woburn Square, Major Maurice Wright, R.A.F. (late R.N.A.S.), elder son of Mr. and Mrs. Arthur Wright, of 3, Addison Road, Kensington, was married to Winifred May, younger daughter of the late Charles Holford Cowles, of Southport, and of Mrs. W. R. Waller, of "Lugano," Buckhurst Hill.

MILITARY.

Engagement.

EYCOTT-MARTIN—HORNER.—A marriage has been arranged, and will shortly take place, between Capt. H. R. Eycott-Martin, R.E., R.A.F., elder son of Mr. Eycott-Martin, late O.S. of British Bechuanaland, and Mrs. Eycott-Martin, of Lindfield, Sussex, and Muriel, only daughter of Mr. and Mrs. F. H. Horner, of Putney.

Birth.

GOODALE.—On March 28th, at St. Edmundsbury, Royston, Herts, the wife of the late Lieut. W. H. Goodale (Canadians), attd. R.A.F., of a son.

* * *

Information is wanted as to the fate of Lieut. R. E. Bion, 20th Hussars, attd. R.A.F., No. 40 Squadron, who took part in an attack on April 18th, 1918, near Lacon, and who fell and was presumably taken prisoner, but from the moment of the attack all trace of him has been entirely lost. His relatives, who are in India, are anxious to hear of his fate, and hope that this will catch the eye of some of his fellow-officers. Communications will be gratefully received, addressed to "Secretary to Headmaster, Clayesmore School, Winchester."

* * *

Sec. Lieut. Hubert W. Ransom, R.F.C., 70th Squadron, has been missing since March 27th, 1918. He was last seen flying Sopwith Camel No. C/8234, in the Albert area. Any information will be gratefully received by his father, Mr. F. Ransom, The Chilterns, Hitchin.

* * *

Lieut. J. A. Ponchet, D.C.M., R.A.F., of the 56th Squadron, R.A.F., was reported missing on Oct. 5th, and has since been reported killed, whilst engaged on patrol with nine other officers, over Cambrai. He was flying S.E.5a 5708. Any information or details will be gratefully received by Miss K. Spikins, C.T.B., Parc du Cinquantenaire, Bruxelles.

AIR FORCE.

Death.

BAINBRIGGE and OTTEWELL.—An inquest was held at Bournemouth on April 4th on the bodies of Capt. Arthur de L. Y. Bainbrigge, R.A.F., aged 32, and Lieut. John Hiller Ottewell, R.A.F., aged 43, who were killed near Bournemouth on April 2nd in an aeroplane accident. They had only left an aerodrome about five minutes when the machine crashed to the ground from a height of 500 ft. Mr. Ottewell was picked up dead, and Capt. Bainbrigge died whilst being conveyed to hospital.

The Air Force authorities said they were satisfied that the machine was in perfect order, and that the accident was caused by an error of judgment on the part of the pilot.

Medical evidence was that death was due to injuries received, and a verdict was returned accordingly.

Capt. Bainbrigge had seen active service at the Dardanelles and at Salonica.

Marriages.

CAREY—REYNOLDS. — On April 1st at Christ Church, Crouch End, Major Gordon Vero Carey, R.A.F., (late Rifle Brigade), younger son of the late Francis Carey, of Burgess Hill, Sussex, and Mrs. Carey, of 85, St. Mark's Road, W.10, was married to Eila, only daughter of Mr. and Mrs. G. W. Reynolds, of Upcote, Shepherd's Hill, Highgate, by the Rev. R. N. Pyke.

Engagements.

ARTHUR—ELLIOTT.—A marriage has been arranged, and will take place on April 12th, between Captain Frederick Russell Arthur, R.A.F., eldest son of Mr. and Mrs. Frederick Arthur, of Surbiton, Surrey, and Alice Mary, daughter of Paymaster-Captain Stanley E. Elliott, R.N., and of Mrs. Elliott, of Sherwood, Saltash, Cornwall.

CULLINAN—LEAVER.—The engagement is announced between Lieut. Roland Vivian Cullinan, R.A.F., second son of Sir T. M. Cullinan, D.S.O., and of Lady Cullinan, of Johannesburg, and Sylvia Kathleen, youngest daughter of Mr. and Mrs. Frank Leaver, of Lisnamoe, Cheltenham.

GARNETT—DAWKINS.—A marriage has been arranged between Major W. H. S. Garnett, R.A.F., only son of the late Mr. Frank Garnett and Mrs. Garnett, of Wood End, Wickham, and Enid, widow of Lieut. C. R. Dawkins, B.A., LL.B., 9th Welch Regt., of The Bungalow, Haverfordwest.

KITSON—SACKVILLE.—A marriage has been arranged between Capt. Robert Graham Kitson, R.A.F., son of the late Rev. John Francis Kitson, vicar of Antony, and Mrs. Kitson, Elbridge, Brixton, near Plymouth, and Mabel Elizabeth Sackville, second daughter of the Rev. G. E. F. Molineux, vicar of Colyton, Devon.

SALWAY—MORGAN.—The engagement is announced between Serjt.-Pilot C. Salway, R.A.F., son of Mr. and Mrs. G. Salway, of Somerset Hotel, Port Talbot, S. Wales, and Ivy, younger daughter of Mr. and Mrs. W. Morgan, of 12, Richmond Street, Neath, S. Wales.

TOTTENHAM—PERKINS.—The marriage arranged between Mr. Harold Loftus Tottenham (late Rifle Brigade and R.A.F.), and Miss Veronica Bowen Perkins will take place on Wednesday, April 30th, at St. Mary's Church, Cowbridge, Glamorganshire, at 2 p.m.

Births.

CLARKE.—On March 25th, at 7, Grosvenor Square, Southampton, the wife of Lieut. P. H. Clarke, R.A.F.—a daughter.

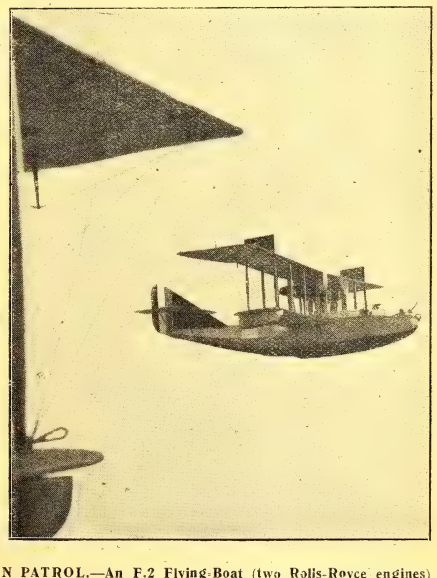
HARRIS.—On April 4th, at The Gables, Highland Road, Purley, the wife of Lieut.-Colonel S. H. B. Harris, R.A.F., of a daughter.

HOLMAN.—On March 26th, at White Lodge, Canterbury, the wife of Capt. C. E. Holman, R.A.F., of a daughter.

SWAN.—On March 29th, at West Bank, Esher, Surrey, to Maria (née Albenga), wife of Capt. J. Barye Swan, R.A.F.—a son.

R.A.F. Cadets—Outfit Grant.

The Air Ministry have issued an Order (No. 409) stating that Cadets and Flight Cadets (including those already demobilised) will be granted, on application, certain outfit allowances. Full particulars of the allowances are given in Form F.S. 751, copies of which can be obtained on application to the Clerk-in-Charge, Air Ministry Publications Depot, 45, Belvedere Road, S.E.



ON PATROL.—An F.2 Flying-Boat (two Rolls-Royce engines) A Photograph at the R.A.F. "War in the Air" Exhibition.

Athletics in the R.A.F.

On Wednesday, April 2nd, the R.A.F. (Uxbridge) were beaten by the R.A. (Woolwich) by seven goals to nil in a hockey match at Woolwich.

The semi-final of the Bulldog Cup Competition was replayed on Wednesday, April 2nd, for the third time, when the R.A.F. (Rochampton), holders of the cup, met the Grenadier Guards. After a well-matched game the R.A.F. team finished winners by one goal to nil. They will play the Scots Guards in the final round at a future date.

The R.A.F. Rugby football team beat the Gloucester fifteen on Saturday, April 5th, by a goal, a dropped goal, and three tries (18 points) to a goal and a try (8 points).

Alcohol and Aviators.

The following letter has been received:—

Sir,—In your leader of April 2nd, on "The Selection of Aviators," I am unintentionally misquoted as regards my views on the question of alcohol. I am reported to have said at the Institute of Actuaries that "Other things being *equal*, the fact that a man is a teetotaler would go against him."

Such a statement is calculated to give offence where none is intended. What I actually said was that in the examination of a candidate "Other things being *doubtful*, the fact that a man was a teetotaler would go against him." In other words, the teetotaler about whose temperamental or physical efficiency (particularly temperamental) there is any doubt, is, in my opinion, not calculated to withstand the strain of flying.

The point under discussion was the granting of preferential policies to total abstainers, and I expressed my personal opinion that such discrimination in favour of the teetotaler might be carried too far as against the fit moderate drinker, and cited the above example.

As many hundreds of flying officers and cadets can testify, I have consistently drawn attention to the evils of alcohol, particularly when taken before flying.

In my addresses and writings I have also expressed the opinion many times that alcohol is best avoided by the flying man, and that the taking of alcohol, particularly in the form of "steady drinking" insufficient to produce intoxication, cannot, if persisted in, end otherwise than in disaster.

(Signed) Martin Flack. Lieut.-Col.

[One deeply regrets that, as Colonel Flack courteously and correctly interprets it, one should have unintentionally misquoted him on the subject of the use of alcohol. Possibly in discussing the question thereafter, one expressed oneself rather carelessly, for if one examines the matter carefully one perceives that there is really nothing in the misquotation which disagrees in essentials with Colonel Flack's views, though, if anything, his expression is even more inclusive than the misquotation.

What one understood him to mean was that if two men were applying for one job either in the Air Force or in commercial aviation, both equally good or equally doubtful men as the case might be, the choice would be in favour of the moderate drinker as against the teetotaler, a view with which one concurs most heartily. The interpretation of Colonel Flack's own phrase possibly reaches a shade further than that, but here again anybody with a working knowledge of humanity will agree with him entirely, for, in the event of a man suffering from any temperamental or physical deficiency, if he is an absolute teetotaler he is very much more likely to collapse under a sudden nervous or physical strain than is the man who is a moderate user of alcohol.

As one has already pointed out, it is recognised in all Colonial Services that the moderate drinker is much better able to stand the effects of an immoderate climate than is the teetotaler, and the same argument would obviously apply to aviators, whose duties in the operation of the big air lines will bring them into direct contest with extreme variations of temperature in very brief periods of time.—C. G. G.]

To Canadian Aviators.

All Canadians of all ranks in the R.A.F. who are interested in co-operation for military, commercial, and social purposes on their return to Canada are invited to write to "Canfly," c/o The Aeroplane, 166, Piccadilly, W.1, giving their names and addresses.

As stated last week, this has nothing to do with any employment agency, nor is it concerned with any register of pilots. It is merely an effort on the part of a Canadian officer, who is returning to Canada, to keep Canadian aviators in touch with developments and with one another.

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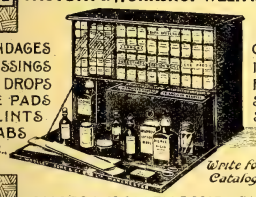
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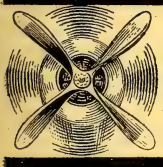


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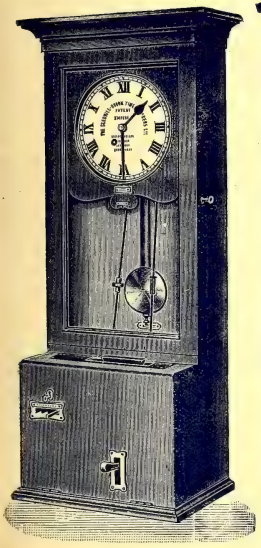
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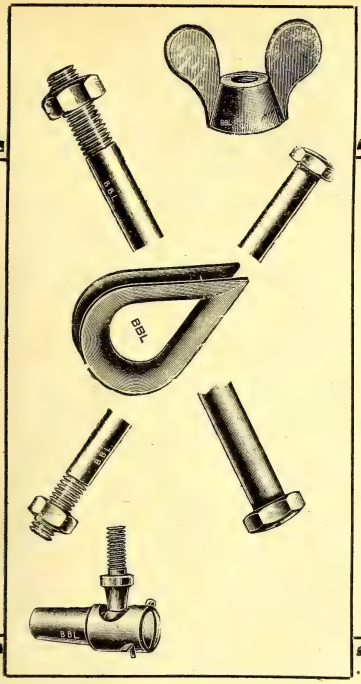
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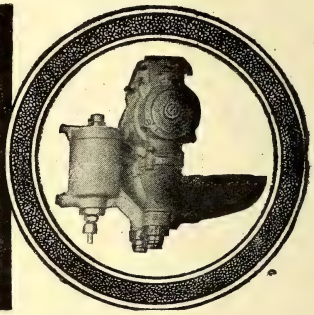
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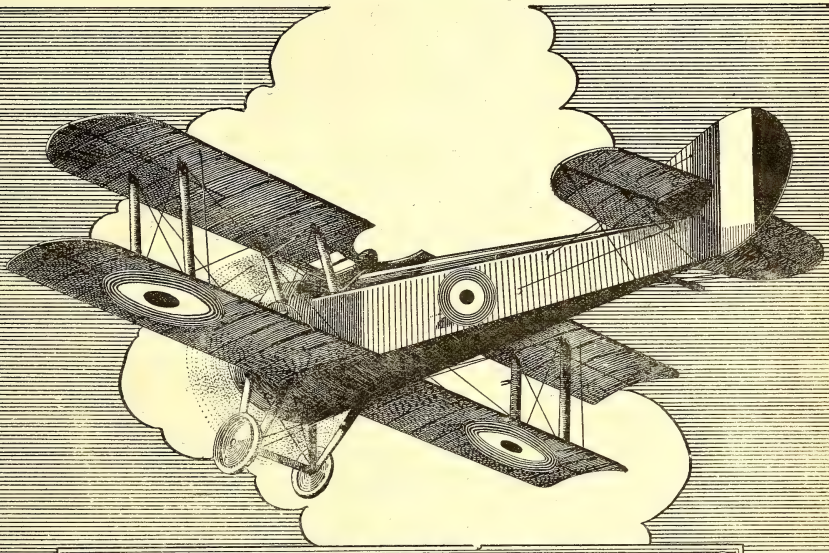
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ON WHAT WE MIGHT DO FOR OUR BOYS.

Last week one put on record the fact that the Appointments Department of the Ministry of Labour (at St. Ermin's Hotel, S.W.2.) is doing its best to find jobs for demobilised officers and airmen of the R.A.F. and that a special sub-department (Room 238) has been established at which those seeking for jobs may perchance find them. Also one appealed to heads of businesses and other employers to notify that department whenever they may have a vacancy. At the same time one pointed out that the Air Ministry itself might do a good deal to induce the youth of this country not merely to stay in the country but to stay in the R.A.F., rather than emigrate, as so many of them apparently intend to do. One proposes this week to discuss this side of the great question, "What Shall We Do With Our Boys?"

It seems to be a fact—lamentable, but a fact none the less—that the Air Ministry is in rather more than an average muddle. As an R.A.F. officer put it, "The Bolo is more Boloish than ever," and, in the expressive phrase of an Anglo-French friend, "It doesn't seem to know whether it is on its topsy or its turvy." Probably the continued absence, owing to illness, of General Trenchard, Chief of the Air Staff, accounts for the fact that everybody in the Air Ministry is completely out of control in a flat spin—if one may use a pilot's simile.

Whatever the cause, it seems to be regrettably true that nobody will give a definite decision about anything that matters. And, unfortunately, this is just the time when quick and yet far-seeing decisions are urgently needed if the best of our young aviators are to be kept in the Air Force, and if those who cannot be given permanent commissions are to be offered some inducement to stop at home, so that we may have a reserve of aviators on hand ready for the next war.

Delaying Developments.

Now it is fairly obvious that so far as the latter business is concerned the best inducement of all to persuade young demobilised aviators to stay in this country is to give them jobs as aviators. And equally obviously they cannot find jobs as aviators unless they are allowed to fly, and unless aerial transport firms are allowed to operate. Therefore the first thing to do is to issue those long-promised Regulations concerning civilian flying. Until they are issued no transport firm can possibly make any considerable arrangements in advance. The announcement that civilian flying will begin on May 1st does not help matters very much.

Even if it were possible to-day to begin to make definite arrangements, such as fixing contracts for the supply of aeroplanes and engines, for the engagement of pilots, ground staffs, and mechanics, for the leases of aerodromes, for the booking of dates of exhibitions and so forth, it would probably be some weeks after the date on which civilian flying is to become legal before everything could be in proper working order. And, as one noted some weeks ago, the longer we have to wait before flying begins, the shorter is the time this year in which aviators and their employers will be able to earn the money necessary to tide them over the winter.

One has every sympathy with Sir Frederick Sykes in his task as Controller of Civil Aviation, and one quite realises that he is up against very great difficulties. The delay is not of his making, for all know his enthusiasm for flying. But there seems to be a hitch somewhere in the chain of responsibility.

A Parable from Thibet.

There used to be years ago a story told of Colonel Younghusband's expedition into Thibet—the story is probably untrue and anyhow it is not libellous, so one feels pretty safe in telling it. Also it may be adapted for the present war and told of the Italian Alpine Front by substituting mules for yaks.

A column of British transport, consisting of R.E. material packed on yaks, or some such prehistoric animals, was toiling in single file up a Himalayan pass at some 15,000 feet, when something blocked the head of the column and it all came to a standstill. A weary transport officer at the tail of the column started upwards to investigate the cause, climbing monkey-wise over crags and squeezing between odorous yaks and the back wall of the precipice.

Some thousand feet or so higher he came upon a phlegmatic Sapper sitting on a crag smoking his pipe, with his feet swinging over hundreds of feet of nothing, and calmly waiting for the traffic to move on. Of him the transport officer inquired what was blocking the column. And the Sapper replied, "Dunno, Sir! I 'xpect some o' the stair-rods 'as come out 'igher up, Sir!"

It looks as if some of the stair-rods at the Bolo House had come out somewhere in the hierarchy of officials, and one suggests that it is the job of Mr. Churchill, General Seely, and Sir Frederick Sykes to put them back or find new ones as soon as possible. One knows that certain of the very best men in the place are leaving it, whether out of sheer disgust or because they can see no future in the Air Force one does not pretend to say. But, if the work of organising the Air Ministry, both on the Military and Civil Service sides, is to progress, the best man ought not to be allowed to leave.

The Need for Tradition.

If the good soldiers with the traditions of the Old Army leave the R.A.F. and only those people remain who cannot find decent jobs outside, it is a precious poor look-out for the future of the Military side of the Air Force. Someone said not long ago that the aim of the R.A.F. should be to become as smart as the Guards

and as handy as the Navy. Such a desirable state of affairs can only be attained by keeping the very best people in the Force, and one fears that the best people will refuse to stop unless the staff of the Air Ministry mends its ways.

Similarly, unless the Civil side acquires a smart, diligent, and intelligent staff, there can be no hope for Commercial Aeronautics. Quick decisions must be given, and there must be very much less of the delay and red-tape methods which are more or less inevitable when the work of a very big war is being run by a small staff of trained officers cumbered by an enormous mass of unskilled civilian assistants.

The Command of the Air.

As Mr. Joynson-Hicks pointed out some few weeks ago, just as we held the command of the sea because we hold the coaling stations of the world, so we can hold command of the air because we hold within the British Empire the landing-places of the world.

Mr. Kipling's prophetically conceived Aerial Board of Control, commonly known as the A.B.C., adopted for its motto the phrase "Transportation is Civilisation." And it must be evident that if the British Empire is to hold together, despite its being the most scattered community in the world, then quick inter-communication and transportation must be the links which will bind together its particular form of civilisation.

Now, just because aircraft are by a good deal the quickest of all vehicles, it is evident that if the British Government honestly desires to maintain the unity of the Empire its first care should be to encourage flying before almost anything else. Also, because flying is primarily a young man's game, the Government should do everything possible to encourage the youth of the nation to fly.

A Counsel of Perfection.

And so, instead of cutting down the establishment of the R.A.F., and thus turning adrift some thousands of young men who possess a more or less intimate knowledge of flying and everything pertaining thereto, the ideal policy of the British Government should be to keep in the R.A.F. everybody who is worth keeping, and to build up an enormous reserve force with an eye to future developments. Every pilot belonging to every licensed Aerial Transport line should be compulsorily a reserve pilot of the R.A.F., and every effort should be made to encourage civilian pilots who fly for pleasure to become members of the R.A.F. Reserve.

That, of course, is a counsel of perfection, for one quite recognises the impossibility of extracting enough money from the Treasury in so-called "Piping Times of Peace," though in fact the way in which the defences of the country are handled in peace-time incline one rather to think that the word "piping" has to do with the ancient Naval expression "piping one's eye" rather than with playing upon the flute or other joyous wind instrument.

The Art of Wangling.

Nevertheless, there are ways of getting things done if an individual or a nation desires them badly enough. Four years and a half of war have turned us into a complete nation of "wanglers," and four months of a devastating peace have demonstrated fairly conclusively that the art of wangling acquired during the war, together with its concomitant art that of "scrounging," are likely to be even more useful in the future than during the war.

If the authorities at the Air Ministry have not learned these two great arts—and, judging by the operations of the Bolo House, one gives its inmates credit for being experienced in the first-mentioned at any rate—it is quite time that they gave place to people who *have* learned the great lessons of the war, and who are able, in spite of Treasury limitations, to run a big Air Service on very little money. One recalls, for example, how Mr. Churchill at the Admiralty before the war, being unable to obtain as much money as he wanted for the R.N.A.S., devoted the Air Service money to things concerned purely with aviation, and paid for the rest out of the vast sums freely voted for the Navy as such.

The Greatest Mistake of All.

A little consideration will show how much might be done for the youngsters who are keen on flying, if the R.A.F. authorities will set to work in the right way. It is fairly generally known that for some months past practically all flying in the R.A.F. has been stopped.

It is true that some few privileged persons are still allowed to fly. For example, Squadron Commanders are still flying on duty, and experimental flights, which unfortunately in these days are few and far between owing to the fact that few experimental machines are being built, are still being made. There are a few communication squadrons employed in transporting officials and documents from London to Paris, and officers and mails from London to France, Belgium, and Germany. But all training has been stopped, and therein lies the greatest mistake of all.

The very people who are most anxious to fly, and who in the future interests of the British Empire ought to be taught to fly, are the very people who are not allowed to fly. The training aerodromes are choked with youngsters who, instead of being allowed to fulfil their hearts' desire and become aviators, are merely kicking their heels in idleness, awaiting demobilisation.

Such aerodromes as are not in this state are practically empty of personnel, because the cadets and young officers of the Army who have been detailed for training as aviators are being demobilised—generally very much against their will.

A Rank Injustice.

Worse still, trained pilots who have had the misfortune to be brought down in Hunland on active service, in very many cases through no fault of their own, but simply because of the defective engines supplied to them by an incompetent Technical Department, are being demobilised. They are being kicked out without being given even the opportunity of qualifying for a permanent commission in the Air Force or for service with the Army of Occupation, and thus all the money which was spent on them in the past in training them to become efficient active-service aviators is being thrown away.

This is obviously a very short-sighted policy from a purely economic point of view, quite apart from the fact that it is a rank injustice to men who have suffered considerably more for their country through their imprisonment in Germany than have those who had the good fortune to escape being captured and have had the honour and intense pleasure of fighting till the end of the war.

What Is the Reason?

It is obvious that the reason for stopping flying is not shortage of machines, nor the cost of petrol and oil necessary to run them, for to use the American metaphor—which seems to be interpreted literally by many people in the R.A.F.—we have aeroplanes to burn. One understands that the burning of aeroplanes is quite an important industry in some places, despite the best efforts of the Salvage Department to economise material, and if we can spare petrol to burn them we

can spare petrol to fly them. Also, the cost of petrol and oil used if training went on as usual would be quite trivial compared with the waste which goes on in other directions.

The real reason for stopping flying seems to be that at most of the aerodromes there are about a dozen officers and cadets for every one air-mechanic, and so there is, in the official view, nobody to keep the machines in proper flying order.

This state of affairs has occurred because the airmen are as a rule of the class commonly called "tradesmen," and in one way or another come under the recent regulations qualifying a man for prompt demobilisation. That is to say, a number of them are over 37 years of age, many of them are in very low medical categories, and a very high proportion are what are known as either key, pivotal, slip, or essential men in one industry or another. In addition, many have been demobilised on compassionate grounds as proprietors of one-man businesses.

Therefore, the Government having once admitted the eminently idiotic principle that we are no longer at war, and that consequently it is no longer necessary to maintain the King's Services at full strength, it is fit and proper that the men who are essential to the operation of the Flying Services should be demobilised.

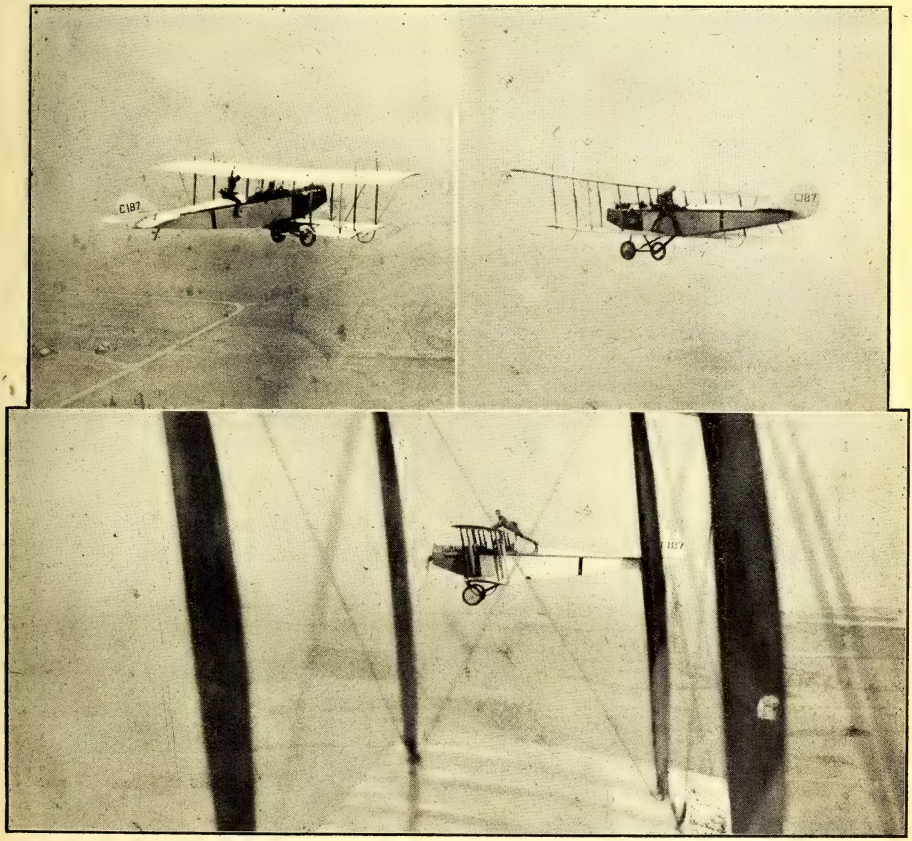
Continuing the Good Work.

Nevertheless, there seems no essential reason why the aeroplanes of the R.A.F. should not be kept in perfect flying condition by the officers and cadets themselves. Any young officer or any cadet who has reached the stage qualifying him to be sent to an aerodrome for training in flying has already had a good many weeks—and in some cases months—of technical training at the R.A.F. Schools of Aeronautics, such as Reading or Oxford, before going to the aerodromes.

Unless the examinations at those Schools of Aeronautics are a perfect farce, which one confidently believes they are not, all those youngsters ought to be perfectly capable of doing the work of any second-class or third-class air-mechanic if supervised by experienced flight-serjeants or workshop officers. Many of the said cadets are, in fact, very much better mechanics than a good many of the first-class air-mechanics in the R.A.F., and they would very soon be fit for promotion to N.C.O. mechanics. Therefore there cannot be any sound reason for stopping flying because of lack of labour.

The Social Objection.

It is true that all these cadets joined the R.A.F. on the understanding that if found suitable they were to be made commissioned officers. But they also did so



IMBECILITY IN EXCELSIS.—An American "Stunt," Photographed by an Accomplice.

on the understanding that if not considered suitable as officers they were to become N.C.O. pilots.

Therefore it would be perfectly fair to them if they were given the choice between doing an air-mechanic's work while being taught to fly, and leaving the R.A.F. at once without any rank at all. Or, in the case of those who have come in from the Army, they would leave with the Army rank which they held before becoming R.A.F. cadets, and would draw the gratuity to which that rank entitled them.

A Fair Choice.

If the Air Ministry is going to demobilise all the cadets against their wills, then it is fair to give them all honorary commissions on leaving and to give to each a gratuity which will cover the cost of the officers' uniform which he has had to buy as a cadet. But one is almost convinced that in the majority of cases if a cadet were given the choice between going back to civilian life with an honorary commission, plus his out-of-pocket expenses, and remaining in the R.A.F. as an air-mechanic on the condition that he was taught to fly, and on the understanding that if he showed the necessary ability he would have at least a sporting chance of obtaining a permanent commission on his merits in the course of the next three or four years, the great majority of the cadets would choose to remain in the R.A.F. and become pilots.

It is fairly certain that most of the youngsters who joined R.A.F. cadet battalions straight from school, or who came into cadet battalions as N.C.Os. or men in the Army, did so because their most earnest desire in life was to become aviators, and one does not for a moment think that they would throw away the chance of learning to fly simply because they cannot be made commissioned officers.

Acknowledging a Principle.

It has for some time been accepted as a principle that in time to come there will be more and more pilots who are airmen and fewer who are commissioned officers, and the present moment seems to be a Heaven-sent opportunity for putting that principle into force. It might even be possible, in view of that famous and much-debated phrase of General Seely's before the war, when he said that the R.F.C. was to be the "*Corps d'élite*" of the British Army, to establish the R.A.F. as a kind of "*Service d'élite*" of the King.

One recalls, for example, that all proclamations to a certain regiment of Household Cavalry begin "Officers and Gentlemen of the Royal Horse Guards," while those to the other regiments begin "Officers and Troopers of the Life Guards." It is quite possible that by a careful process of selection of the whole personnel from top to bottom it might be possible in time to address the R.A.F. as "Officers and Gentlemen of the Royal Air Force" instead of as "Officers and airmen"; and one believes this truly despite the fact that at present one would not even venture in many cases to address the commissioned people themselves as "Officers and gentlemen."

The Supply of Mechanics.

But, be that as it may, the fact remains that, whether the cadets are to be considered as gentlemen or as "fellows of the baser sort," to use an ancient phrase, they are undoubtedly available as mechanics to keep aeroplanes and engines in flying order, so that the process of training may be continued and so that the number of aviators available for future wars in which the Empire will be concerned may be increased.

Any youngster who is too proud to clean his own engine or aeroplane, or to do repair jobs on it, or to work in squadron repair shops, should be ejected from the R.A.F. promptly. Judging by the pleasure which most of us have taken during our youth, and even in our advanced middle age, in delving in the bowels of a car or a motor-cycle, or any other kind of messy mechanism, one fancies that there would be very little trouble on this particular score. Consequently there must be any quantity of mechanical talent available with which to continue the flying training of the Air Force.

The Matter of Cost.

It hardly seems likely that the question of pay and maintenance accounts for the stoppage of flying, because the Air Force authorities are apparently extremely anxious to enlist air-mechanics as fast as possible. And whether they get their air-mechanics or not, the country has to pay and maintain all those thousands of young officers and cadets until they are demobilised.

The process of demobilising the cadets and unwanted officers does not seem to proceed very rapidly, and the result is that there are a number of young and healthy men kicking their heels in idleness about the aerodromes, drinking in the mess, and—one is credibly informed—flirting with W.R.A.Fs., W.A.A.Cs., and W.R.N.S. round the backs of the sheds, which is strictly contrary to regulations. One has even heard that officers borrow jackets from N.C.Os. and men so as to avoid getting into trouble through being caught breaking the regulation against officers talking to the women workers at the aerodromes other than strictly on business.

The Benefit of Hard Work.

If all these youngsters were kept busy working on their machines, or actually learning to fly, all day long, there would be very little chance of their getting into trouble through bad behaviour of any kind. After a busy day's work they would be mighty glad to go to bed early, especially if they had to get up and start flying and working at 5 o'clock in the morning.

So badly does the whole thing seem to be arranged that apparently at some aerodromes the best employment that can be found for the cadets is the job of breaking up perfectly good flying-machines with crowbars and axes. This is euphemistically called "reducing to produce" the machines in question. One suggests that if it is desired to break up machines, those who have already learnt to fly a little might at any rate be afforded the opportunity and pleasure of breaking the machines to smithereens in a really good enjoyable crash from the air rather than be forced to waste their time in hewing them asunder, in the manner of Agag, on the ground.

What Might Be Done.

If the authorities had the sense to do the right thing and continue the training of pilots, when a man had passed as an efficient pilot, he could be relegated to the R.A.F. Reserve if he desired to be demobilised. If he desired to stop in the Air Force and to continue flying, then at any rate he ought to be given the opportunity of remaining as an airman-pilot, even if he could not be given a commission.

If after an adequate course of training he showed conclusively that he would never become a pilot, then he could still be given the choice of remaining as an air-mechanic or leaving the R.A.F. If he elected to leave, then he would be in no worse a position than he would be if he were demobilised to-day without the option of stopping. In fact, he would be in a somewhat better position, because he would have had just that much extra training as a mechanic, and so would be capable of earning a living as such in a factory or garage.

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the obviously sensible thing to do seems to be to start flying training again in all the training squadrons. The greater the number of youngsters who are able to fly the greater will be our insurance against another war, for, as General Brancker remarked a year or more ago, our best insurance against another war is to maintain such an Air Force that no other country will ever dare to attack us for fear of invasion by our Air Fleet.

Moreover, the greater the number of youngsters who can fly, the greater will be the demand for aeroplanes in the future, and the stronger the British Aircraft Industry will become. And, as we have so often been assured by various high authorities from Lord Weir downwards, the existence of a strong Aircraft Industry is in itself one of the best possible safeguards against attack by any other Nation.

The Knell of the Navy.

A strong Aircraft Industry is, in fact, as necessary to the safety of the British Empire as is a strong Shipbuilding Industry. Indeed, in the future, the Aircraft Industry must be, from the point of view of national defence, the more important of the two.

If we have sufficient bombing aircraft to make it impossible for enemy nations to operate with submarines, and if we have sufficient torpedo-carrying aircraft to make it impossible for an enemy to operate with surface ships, then we can hold the Command of the Sea from the air without caring whether we have a Navy or not. Our Air Fleet will be capable of guarding our shores and our sea routes against any attack by enemy warships and will assure to our own merchant ships the uninterrupted use of the sea routes, thus assuring the free and uninterrupted import of food and raw material and export of troops and war material.

The Use of Enthusiasm.

The youth of the country to-day is full of enthusiasm for flying. Keen and intelligent boys of all classes are as willing to work at anything concerned with aeroplanes, provided that they are also allowed to fly, as were those enthusiasts at Brooklands and who slaved day and night on a mere pittance, and frequently without wages at all, so long as they were allowed to have a hand in the building of their beloved aeroplanes.

If the young officers and cadets of whom one has written are too proud to do a man's job of work at an aerodrome, then they can very easily be replaced by thousands of youngsters who are only now reaching military age and who are intensely desirous of working on aircraft anywhere, and at any time, so long as they are assured of the chance of flying.

Therefore it is perfectly evident that if we only have the sense to lay ourselves out to encourage aviation sensibly and to make use of the enthusiasm for flying which exists among the rising generation we shall not only do quite a lot for our boys, but we shall do quite as much for ourselves at the same time by providing ourselves with that best of all insurances against future wars, namely, a striking force in being, which will be sufficient to put the fear of God into our enemies.

C. G. G.

THE ROYAL AERO CLUB AND ALTITUDE RECORDS.

A correspondent writes alleging that there is a considerable difference between the methods employed by the Royal Air Force and the U.S. Air Service in computing altitudes reached by aircraft. As is commonly known, the altitude shown on the aneroid carried by an aircraft does not indicate the correct height above sea level, because the aneroid is affected by variations in barometric pressure on the particular day on which a flight is made, and by temperature and density of the air at the altitude reached. Therefore, the figures shown on the aneroid have to be corrected according to these influences before the real height can be found. The correspondent in question states that in making allowances for barometric pressure, etc., the U.S. Air Service deducts more than does the Royal Air Force.

This statement bears very importantly on the existing claims to the altitude record. For example, it is claimed that Major Schroeder, U.S. Air Service, flying an American-built Bristol Fighter with a 300-h.p. Hispano-Suiza engine, reached an altitude of 29,800 feet, and that Captain Lang on an Airco D.H.9 with a Napier "Lion" engine of 450-h.p. reached an altitude which, as corrected, is given as 27,350 feet. It is not as yet known whether Major Schroeder's figure is the corrected figure, or merely the aneroid figure, and the heights claimed are obviously affected also by the question as to whether there is a difference between the British and American methods of computation.

One suggests that this is a matter with which the Royal Aero Club should deal promptly. The R.Ae.C. is supposed to be the body which governs the sport of flying in the British Isles, and is concerned with the verification and passing of all claims for records. So far, the Aero Club has made no statement concerning the record claimed by the makers of the machine and engine flown by Captain Lang, and it is not even known whether a formal claim to the record has been entered either by these firms or by the pilot and passenger.

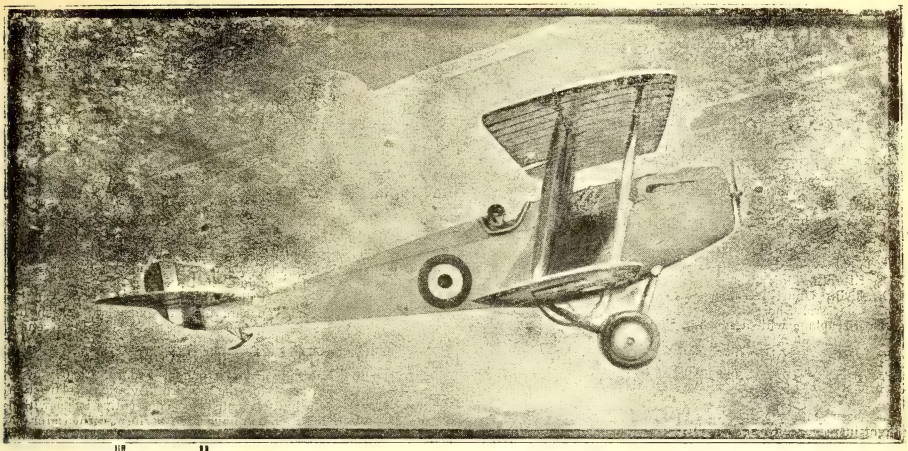
It seems, therefore, that it is very much the affair of the Royal Aero Club to issue a public statement on these figures. If no record has been claimed for the British performance, then the Aero Club's duty is to state that the performance is not officially a record. It is also the duty of the Club to say whether the American record is a record or not.

One can quite understand that owing to the strenuous war work of all the members of the Committee of the Royal Aero Club the functions of the Club as the governing body of the sporting side of aeronautics have fallen into a state of innocuous desuetude, so one desires to draw the attention of the Committee to the fact that in future there is going to be a good deal of work of this nature to which it will be required to attend, therefore it might very well begin on this matter of the claim to the Altitude Record.

The Committee of the Royal Aero Club may very well be heavily occupied in looking after social matters in the Club, but in the interests of aeronautics it seems that the sporting side of the Club's activities are actually of more importance than what may be called, perhaps without offence, the hotel-keeping side.

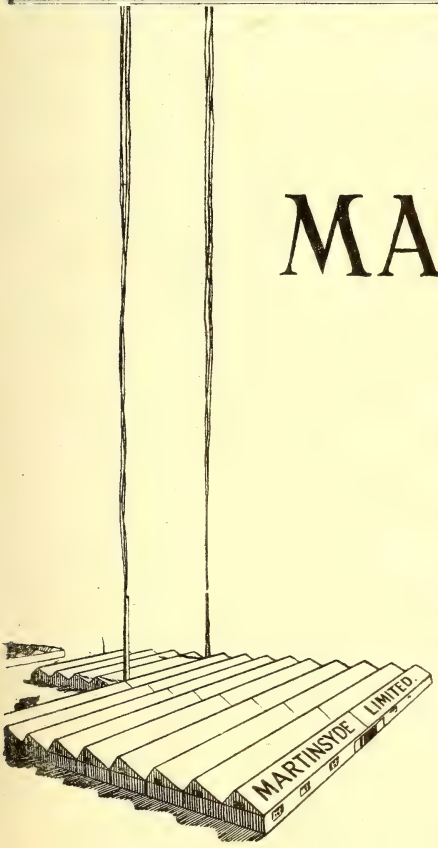
AIRCRAFT SALVAGE.

It appears that a good many people who wish to buy aeroplane salvage material are under the impression that applications for such material should be made to the Air Ministry. Such persons should, therefore, note the fact that the Air Ministry is not at all concerning itself with the disposal of obsolete aircraft and aircraft material. All inquiries respecting complete aeroplanes, engines, component parts, or salvaged raw material should be addressed to the Aircraft Disposal Department, Ministry of Munitions, York House, Kingsway, W.C.2.





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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

A Royal Flight.

H.R.H. the Prince of Wales, K.G., and Captain the Prince Albert, K.G., R.A.F., motored to Wallington Aerodrome on April 8th. The Prince of Wales ascended in an Avro biplane with Major Bird as pilot, and the Prince Albert flew with Lieut. Coryton, his instructor. Both machines flew for about half an hour.

General Seely's Flight to Parliament.

On April 10th, Major-General J. E. B. Seely, C.B., C.M.G., D.S.O., M.P., Under-Secretary of State for Air, flew from the works of Messrs. Short Brothers at Rochester to Westminster in a Short seaplane with a 260 h.p. Sunbeam. Mr. J. Lankester Parker was the pilot, and Major S. V. Sippe, D.S.O., O.B.E., accompanied Major-General Seely. The seaplane left Rochester at 4 o'clock and arrived at the Houses of Parliament at 4.23 p.m. Major-General Seely was taken to Westminster Pier by a motor-launch.

It has been stated in the Press that Major-General Seely made the flight in response to an urgent call to the House, but the fact that Press photographers were present leads one to think that those who were responsible for the arrangements had time to consider the opportunity of gaining publicity. A flight of 23 minutes is not sensational, but it is well to keep the public informed of the practical daily use of aviation.

The New C.T.D.

It is now fairly commonly known that Brig.-General H. R. M. Brooke-Popham, C.M.G., D.S.O., has been appointed Controller of the Technical Department, under the Air Ministry, *vice* Brig.-General J. G. Weir, C.M.G., who has returned to his post with his family's firm, J. and G. Weir, Ltd., the famous makers of pumps for marine work. All who know General Brooke-Popham's great work during the war are glad to see him in so responsible a position.

According to Plan.

The Secretary of the Air Ministry announces that the Adelphi Hotel (which was occupied by a portion of the Air Ministry) and the Covent Garden Hotel (which was occupied by the Headquarters, South-Eastern Area, Royal Air Force) have been given up and are no longer occupied by Air Ministry or Air Force personnel.

A German Aeroplane on View.

A twin-engine German aeroplane, which was brought down on the Western Front, is on view in St. James's Park, opposite the Horse Guards Parade.

A Novel Feature.

The "Scientific American" recently published a description of a machine which appears to have a novel feature. "Known as the K.3 type, the Martin single-seater Biplane," says our contemporary, "includes a two-seater horizontally opposed engine of 45 horse-power." One trusts that the cooling arrangements are adequate.

A Hendon Incident.

At Hendon Police Court on Thursday, April 10th, C. W. Warwick, who has recently been demobilised from the R.A.F., was fined £10 for trespassing on the London Aerodrome, Hendon. Witnesses stated that Warwick was dressed in R.A.F. uniform, and, after speaking to a mechanic, he got into an aeroplane and made a flight which lasted ten minutes.

In defence, the accused said he was very keen on flying, and having been in the Air Force, he thought he would like another flight. Thinking he might not get permission and seeing a machine on the ground, he could not resist the temptation to go for a flight.

One is compelled to admit that the fine was not excessive, but one feels it a pity that such keenness should be wasted.

Philosophic Doubts.

The statements with regard to flights from London to Paris in such short times as 80 minutes and 75 minutes have been causing doubts. Some pilots who were employed upon ferry work, and who therefore know a good deal about cross-Channel flying, are asking how the times are taken. At a club the other day one of these experienced aviators said he saw a machine arrive from Paris and heard someone ask the pilot when he had started. The reply was "*about* 4 o'clock," and as the time was then 5.15 another "speed record" was announced in the daily Press.

One would like to know whether the times of some of the recent remarkable performances have been taken officially.

Forethought.

It is reported from Berne that aeroplanes are in readiness to carry the Hungarian Soviet Government across the frontier to safety in case of sudden danger.

When the Dry will Fly.

The prohibition of the sale of alcohol in America may bring into operation an aeroplane ferry from the coast of Florida to the Bahamas, in order that when in extremis a thirsty person may obtain a ration of snake-juice in British territory. It is suggested naively that the most direct route would be taken on the outward journey. There appears to be some subtle reason for making no reference to the course to be steered on the return trip.

The Looping Record.

According to a message from Issoudon, France. Lieut. Joyce, of the testing department of the Third Aviation Instruction Centre, is reported to have executed 300 consecutive loops within 66 minutes. The feat is said to have been performed in a Morane monoplane with a 120 h.p. Le Rhône engine. An average altitude of 2,000 feet was maintained; 24 minutes 30 seconds were required for the first hundred loops, 20 minutes 30 seconds for the second hundred and 20 minutes for the third

Why?

The Enemy Aircraft Department of the Air Ministry has presented four large Zeppelin engines to Leeds. The reason for this donation is not given. One would think that if mementos of the raids are required other places have stronger claims.

The Silent Aeroplane.

During an interview with a representative of the "Daily Mail" on April 14th, Major-Gen. J. E. B. Seely, C.B., C.M.G., D.S.O., M.P., is reported to have said:—

"The greatest desideratum now to make flying both practicable from a commercial standpoint and comfortable from the passenger's standpoint is the reduction of noise in an aeroplane. The deafening roar of propellers undermines the endurance of the pilot and detracts from the enjoyment of the passenger.

"The best engineering brains in British air science are now hard at work on the production of a practically noiseless machine. We shall achieve perfection in that respect, I have no doubt, as we have in others.

"I think we have already reached the point where we may claim that flying is about as safe as, let us say, travel in a fast express train. I no longer think of travelling to Paris by any route except air."

The Soliloquy of a Modern Hamlet.

A contributor to the "Brooklyn Eagle" bemoans his own country's lack of enterprise in the development of aeronautics in the following lines:—

To fly, or not to fly—that is the question.
'Tis not befitting that we stand aloof and
In the aerial fields we pioneered—see
Other nations plunged in contest keen
To wrest the laurels of the skies
That, once, were ours,—to be but cast aside
As trifling baubles nothing worth.
Much better that we gird ourselves anew
And, in the lists, compete for what is but our own
By right of heritage, and in accord
With hist'ry's records of ambitions won and held
In every sphere where skill of men count aught
And Progress holds its sway.

One fain would ask how 'twas we failed
To heed the deeds and pleas of those, our pioneers,
Wrights, Curtiss, Martin,—others who saw,
Writ large on backgrounds of celestial blue,
The warning prophecies of coming days.
Yet we lay dormant. Men of other lands
Foresaw the uses of the bird-like thing
Conceived and born beneath our flag
But fostered 'cross the seas, while we
Inert, supine with smug contemptuous mien
Cared nothing for our passing fancy's child.

There are many more lines in this lament. One remembers a time when writers of America were fond of picturing John Bull as "inert, supine with smug contemptuous mien," and we, on our side, flung charges of boastfulness across the Atlantic. Are we beginning to know each other better at last?


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The WORLD of AERONAUTICS (continued)

An Irishman's Rise.

The title of an article by Major T. Orde Lees in the April edition of "The Quirk" is "The Rise of the Parachute." However, no figures are given to demonstrate the modern parachute's rate of climb.

An Early Attempt to Cross the Atlantic.

According to the "Daily Chronicle" it is now nearly half a century since the first attempt was made to cross the Atlantic by air. For it was in 1873 that a New York newspaper constructed a colossal balloon, in which Mr. Wise, a well-known American aeronaut, might make the journey.

The balloon, however, burst during inflation, and though a start was actually made after its repair, the travellers were forced to descend in Connecticut after a perilous journey.

Holiday Facilities.

A number of aviation companies have decided that it will be possible to arrange for some pleasure flying during the Easter holidays.

Handley Page, Ltd., state that flights will be made in service machines within Government limits from Cricklewood.

The Sopwith Company (Kingston) say that they are quite prepared, but there is a difficulty in finding the pilots. They have got the machines ready, including a two-seater for people who like stunting. Why the difficulty about pilots? London is full of them.

The Grahame-White Company (Hendon) said, according to the "Times":—"We are not organised for the holiday trips. We hope to open to the public shortly after Easter, and then we are to have race meetings, night flying demonstrations, etc., as we did in pre-war days, but on a very much bigger scale. We shall have a machine capable of taking 15 to 20 people. We are not quite ready yet."

The British and Colonial Aviation Company will not arrange special flights during the Easter holidays.

A Flight Across the Alps.

Having obtained passports from the French and Swiss Governments, French aviators, in fourteen machines, flew from Nancy, across the Jura Alps, to Lausanne.

An Accident.

One regrets to hear that an accident has interrupted the attempt of Lieut. Roget to break the Paris, Rome, and back record. On April 12th he arrived at Nice on the return journey, after covering 500 miles in four hours, including 440 miles across the sea, when a windstorm arose as he was about to restart.

The Nice aerodrome is crossed by a small stream, which a sudden gust prevented the pilot from avoiding. One wheel caught in the channel, and the machine overturned, killing a soldier and a boy of twelve. Roget and the mechanic were unhurt.

The 88th Squadron Dinner.

The 88th Squadron's Dinner will be held in London on Saturday, April 26th. Those who wish to be present should communicate with Captain Hepburn, R.A.F., Royal Automobile Club, Pall Mall, S.W.1.

Aircraft and Wireless Telephony.

According to the "Daily Telegraph," while experimental stations of the Royal Air Force in England are engaged upon research work in wireless telephony, out in France the new apparatus is being put to practical use under test conditions in connection with the Folkestone-Cologne aerial mail service. Along this route a chain of call stations is being installed, and the machines engaged in the service are being fitted with both sending and receiving sets.

Already clear voice signals can be transmitted from the aeroplane to the ground and *vice versa* at thirty miles, but as yet the idea has not passed the experimental stage, and the possible range is quite indefinite, and is governed by the powers of the sets employed. A certain amount of voice training is necessary, but compared with the time required to teach Morse this is negligible. What is essential is that the speaking should be clear, deliberate, and pitched in a higher key than the "engine talk," otherwise the voice becomes merged with the engine drone.

The training necessary to enable the fledgling pilot to out-talk a couple of Rolls-Royce engines is a new terror he will have to face. It is presumed that the coiner of the phrase has not been listening to an expert speaking of engine torque.

The Cape to Cairo Air Route.

Major Court Treatt, the officer in charge of the southern survey of the aerial route from Cape Town to Cairo, left Johannesburg on March 27th to inspect the aerodromes on the southern portion of the route. Reuter reports that Major Treatt will visit Chief Khama, who wants one of the aerodromes in his country.

A Good Flight.

A good flight was made recently by Lieut. Gortinez, who, piloting the Bristol aeroplane presented to the Chilian Government by the British Government, flew over the Andes at a height of 19,600 feet.

Another Aviation Prize.

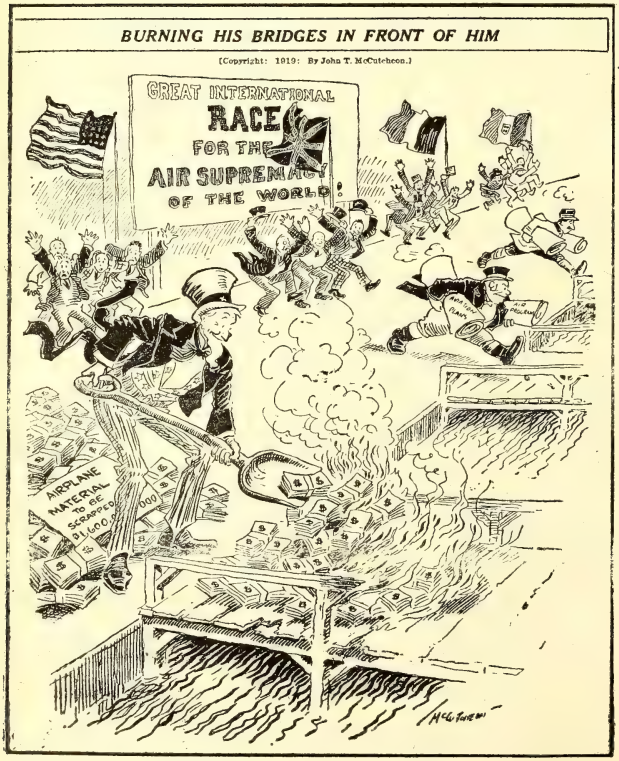
It is stated in Milan that Count Adam Ostaszewski has offered a prize of £4,000 to the first aviator to reach the South Pole.

A Change of Address.

The Air Ministry announces that No. 1 Reception Depot is removing from 40, Upper Brook Street, Mayfair, W.1, to 4, Henrietta Street, Covent Garden, W.C.2, and will be established there as from April 14th, 1919.

The French Aviation Prize.

The British Aerial Transport Company has entered one of its commercial machines for the commercial and touring competition, the winner of which will be awarded a prize of £12,000 by the proprietors of the newspaper "Echo de Paris."



An American View of the Present Situation.

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The WORLD of AERONAUTICS

The U.S. Aerial Police.

The Aerial police of New York City are to be trained at the Municipal Aviation Field, Atlantic City. The school will be opened in a few days.

The police are to be used to guard the flying routes during the aviation meeting of the Pan-American Aeronautical Exposition in May. This will be the first time in the history of aviation for a racing course to be regularly policed by aeroplanes.

An Accident in India.

A message from Calcutta, dated April 2nd, states that eight aeroplanes were leaving Jacobabad for Sibi when one struck a mound and capsized. The petrol tank caught alight and set fire to the machine. The mechanic, William Adams, was burnt to death, but the officers and pilot escaped with slight injuries.

The Return of the Dutch Commission.

The Dutch Commission which has been studying aviation in England left Felixstowe by aeroplane at 2.50 on Saturday afternoon, April 12th, and landed at Amsterdam at 4.23.

This is the first time that an English aeroplane has landed in Holland, apart from forced landings, during the war.

A Peruvian Air Service.

It is reported from Peru that Lieutenant Chapman, representing the Nieuport interests, is at Lima awaiting the arrival of the Nieuport Night Hawk scouting aeroplane. He is negotiating for the establishment of a military school and aerial mail service between Lima and Iquitos.

Promotion of Lieut.-Col. de Goys.

According to a Reuter telegram, the promotion is announced of Major de Goys, of the French Air Service, to the rank of lieutenant-colonel.

It was Lt.-Col. de Goys who organised the first bombing group, composed of Voisin machines, and piloted by men whose names rapidly became known as those of crack aviators. He was taken prisoner in the first raid on Ludwigshafen, and escaped after three years' imprisonment, when he again took command of a squadron, which covered itself with glory during the last German offensive and the Allied counter-offensive which followed.

A Use for Salvage Airscrews.

The following letter has been received:—

Sir,—Re your article "On the Salvage of the R.A.F.," I should like to suggest that the airscrews could fairly easily be adapted as fan blades for the electric ceiling fans or "punkahs" which we use out here by the thousand, every flat in Bombay requiring at least three, and many new houses being or about to be built—whilst during the war and since fans have been almost unobtainable.

Most fans have four blades, but I should imagine that two, properly shaped, would be quite as effective.

Bombay. (Signed) R. P. Chenery.

[The idea of using airscrews as "punkahs" really seems to have something to recommend it. As a matter of fact, an airscrew is not the best possible fan, because it is designed to screw its way through the air without throwing the air about. The reader will probably appreciate the difference between it and a fan when one says that it is much the difference between a wood-screw and an auger or gimlet. All the same, airscrews fixed on a bearing and turned with a belt from a crank, probably would act fairly well as "punkahs." The idea is, at any rate, worth mentioning. There are heaps of four-bladed airscrews in this country which could be bought cheap and used for the purpose.—Ed.]

A U.S. Aircraft Change.

It was reported in Washington on April 7th that President Wilson has issued an executive order abolishing the Aircraft Board and placing all aircraft production funds under the control of Major-Gen. Maher, the newly-appointed Director of the Army Air Service.

The "Middle-aged Boy."

The following letter has been received:—

Sir,—Having read with very much interest your article concerning demobilised R.A.F. officers, both young and old, the experiences of one who comes under the classification of the "middle-aged boy" may be of interest to your readers.

I was one of the 1914 veterans to be demobilised last January, having just previous to the beginning of war completed one year at a famous engineering college at South Kensington.

Hearing that a special second year's course was about to be commenced in February, which would cover a year's work in about four months, the temptation to be demobilised proved irresistible.

Here, I thought to myself, is something for nothing. In due course I was demobilised and rejoined the college on the appointed date. I was surprised to find what a crowd of kindred spirits there was, and what a lot of fellows amongst them I had met before.

In about a week we had settled back to work in great style. We were again plunged into the mysteries of the Calculus.

Many of the demonstrators were demobilised officers themselves. Those who were not appreciated the circumstances and treated us with all the tact we deserved. For the first week or two the work was a novelty, then there came a period of general fed-upness amongst the students.

However, all felt that there was only one thing to do and that was to plug on. To those who had a sense of humour the mixture of war veterans, from majors downwards, all scratching their heads and nibbling the ends of their pens, proved a source of inexhaustible mirth.

We laughed at ourselves, and the very humour of the situation soon dispelled the gloom. Students became more cheerful, and by this time we have settled down to work in earnest.

I advise those fellows who, like myself, have definitely decided to enter a civil profession and not to stay on in the Army, and who are qualified or half-way qualified, to go ahead or finish off the work they have decided to take up.

They will not be alone in their endeavour, and after a month will become acclimatised to the new conditions.

The following points or arguments in favour are in my opinion worthy of consideration.

1. Once having obtained a University degree or diploma they will never have to pass any further examination in their profession.

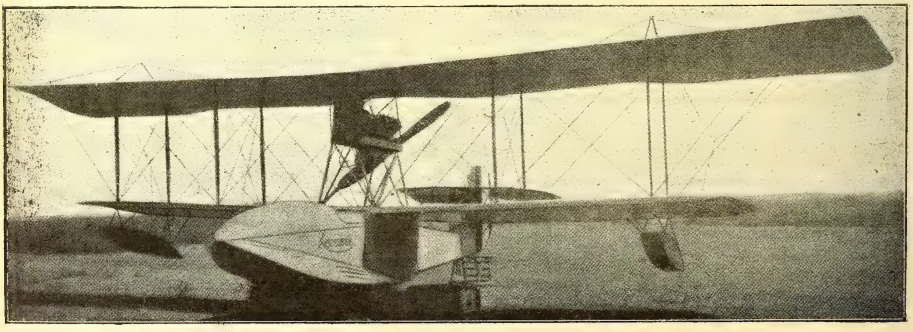
2. They will certainly be in a better position to obtain an appointment having finished their course than they would be if they rushed for a job now.

3. As to expenses:—The Government grant, together with the gratuity, should be sufficient to pay for keep and college fees during the course, provided the "odd noggin" is not too frequently indulged in.

The man who has brought down his dozen Huns should have the "guts" to go through with the hard work necessarily entailed, and should have more self-respect than to dash back to his C.O. and implore for reinstatement after a few days of study.

There is an old Army saying that is still as true to-day as ever before, and that is that God helps him who helps himself. A rider, I think, might be added to the effect,—"Heaven help him who spends his gratuity in trying to find a cushy job and then does not get it!"

C. G. S.



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PARIS NOTES

Aerial Posts.

Week by week it is one's pleasure to record the progress made in the establishment of Aerial Posts. There are at the moment eight different lines in operation, and yet all does not seem to be well. For example, four different organisations share the onus of running eight lines which, on the face of it, points to a dissipation of energy and a lack of governmental co-ordination which is the more deplorable in view of the fact that in the inauguration of commercial or postal air routes the first thing to be avoided is injudicious competition and unnecessary overlapping of Headquarter organisation.

The eight lines are divided between the (1) Civil Aviation Authorities, (2) Postal Authorities, (3) Military Aviation Authorities, and (4) General Headquarters, for example :—

Paris-Lille and Lille-Paris (Military Aeronautics).

Paris-Mauberge-Valenciennes (Civil Aviation).

Paris-Brussels and Brussels-Paris (French and Belgian Military Aviation).

Paris-Strasburg (G.H.Q.) (in bad weather an automobile service is substituted).

Nancy-Longwy-Brie-Nancy (Civil Aviation).

Paris-Bordeaux (non-stop) and Bordeaux-Paris (one stop) at Chateauroux (Civilian Aviation).

Paris-St. Nazaire and St. Nazaire-Paris (relay at le Mans) (Postal Authorities).

Tarascon-Nice and Nice-Tarascon (Postal Authorities)

Le Bourget is at the moment the aerogare of Paris, and, presumably, of the world; for example, every day machines leave the ground from there, for Lille, Brussels, Valenciennes, Strasburg, Bordeaux and St. Nazaire.

A Regrettable Accident.

Unfortunately, for the immediate future of aero-mails, a machine which left Le Bourget at 11.40 a.m. on the 7th inst., caught fire when landing at Bordeaux; machine and mails were destroyed completely, and pilot and passenger burnt. One is loth to record these regrettable incidents, and one wonders whether it is beyond the ingenuity or the acumen of the Authorities to enclose postal packages in fireproof bags so that whatever happened to the machine the mails would be safe.

At 7.30 a.m. on the 3rd inst., Lieuts. Moraglia and Dejobert, of the G.B.5 Squadron left Le Bourget with the object of flying to Bordeaux and back in the same day and on similar machines. Each carried an N.C.O. passenger in his 300 h.p. Bréguet (Renault engine). Dejobert reached Bordeaux, but in getting off again strained his machine, so that the record has still to be made.

The Nice-Tarascon line is running fairly regularly, but the service was interrupted for a short time owing to engine trouble.

March 31st witnessed the inauguration of an aerial post on the Nancy-Brie-Longwy circuit. The journey occupied three hours; four bags of mails were carried. It is intended to open the route for passenger traffic shortly.

When Lieut. Lemaitre made his flight from Toulouse to Casablanca it was hoped that a commercial or postal service would be started forthwith. Not so, however; it appears that France and Spain do not see eye to eye in regard to flying over the latter's territory. Nevertheless, Lieut. Rodier left Toulouse on the 5th inst. in a three-seater, carrying 200 lbs. of mails and two passengers for Morocco. Three hours later he had arrived at Saragosse, having passed over Barcelona on the way.

Aerial Mails to Tunis.

The extreme south of Tunis is to have its aerial post weekly, the service starting each Sunday from Gahès on the arrival of the French mail. The first trial took place on March 30th, and the following were the times :—

Itinerary.	Departure.	Arrival
Gahès	6.30	
Houmtsouk		6.40
Houmtsouk	8.20	
Larzi		8.55
Larzi	9.15	
Ben Gardine		9.30

Aviation and Moroccan Rebels.

Aviation is destined to play a large part in the eventual submission of the Moroccan rebels. In the Ouergla region in the course of a severe engagement between the rebels and the French troops, one of the French posts was surrounded and sustained heavy losses. Soon after, however, 17 Avions bombarded and gunned the rebels who retired giving time for reinforcements to arrive.

Another Possible Entry for the Atlantic Flight.

Lieut. Fontan has just received official permission to attempt an Atlantic flight. With this in view he spent all night on his machine and left Villacoublay on the 8th inst. at 6.1 a.m. for Casablanca, but fog obliged him to stop at Bourges, whence he returned to Paris. Lieut. Fontan hopes to fly from Paris-Casablanca-Dakar, for which the "Daily Mail" has *not* offered £10,000. It would be a bombshell were he to deposit the necessary £100 with the Aero Club and cross the South Atlantic. One presumes that such a flight would be perfectly valid.

The G.3 Caudron.

The little G.3 Caudron, of the same type as that with which Védrines landed on the Lafayette roof, i.e., one fitted with a 100 h.p. Anzani, is very popular just now. Mlle. Jane Hervieu, to whom reference is made elsewhere in these notes, flies one, and M. A. Maicon, a pre-war pilot, has been touring the Midi and the Côte d'Azur in one. He flew 440 kms. in 4 hrs. 20 mins., at 1,200 metres height, stopping for meals at Avignon, Marseilles, and Nice. He is continuing the journey.

Touring by Aeroplane.

Touring the South of France by aeroplane must be very pleasurable on these spring days. M. Galmot, on a Farman F.50 Limousine, fitted with two 275 h.p. Lorraine motors is touring France in company with several friends. Leaving Paris, they followed the course of the Loire until Tours, a voyage of three hours; the next day they "ambled" from Tours to Bordeaux in 2 hrs. 50 mins. The following day they proceeded to Sarlat, from whence they hope to reach Biarritz, returning to Paris through the Gascony country. Certainly, a short journey in an aeroplane gives one ample time to explore a city or its surroundings à terre. Lieut. Constanti is employed as pilot; the day of the aerial chauffeur has surely arrived!

False Rumours.

On two occasions in 10 days the rumour has gone round that the Goliath and its human freight had come to an untimely end once by fire, and secondly, by crashing; happily, both rumours proved to be canards of the first quality, although, in one case, an evening paper became slightly hysterical over the reported catastrophe. Anyway, nothing could be further from actual fact. Last Saturday 14 passengers were carried from Paris to Brussels, among whom were M. Anglés, a Deputy, and Mme. Merset, wife of the Consul-General of Luxemburg. Mr. Sharp and Captain Clark, two pioneer aerial tourists, also "took the air" for Brussels. Just at starting-time a Customs official, two douaniers and "one douanière" presented themselves, and with hypocritical apologies, requested the passengers to declare themselves and their baggage. On Monday, when the Goliath returned, the process was re-enacted in order to ensure that contraband was not being brought to Paris from Brussels. It is probable that two machines will leave Paris for Brussels three times a week in the near future and *vice versa*. The Customs Authorities are making arrangements to establish a permanent office on the Farman Aerodrome at Toussus-le-Noble, near Paris. The Goliath is to undergo a complete overhaul with a view to attempting a height record with 25 passengers.

Aero Clubs and Model Aero Clubs.

Some years ago in England, certain enthusiasts worked off their surplus energy in forming local Aero Clubs and Model Aero Clubs. Where are they to-day? One has not to ask the same question in France, as those who follow these pages weekly may note. From Nimes comes the news that the Aero Club de Gard, founded in 1909, and affiliated to the Aero Club de France has resumed its pre-war activities.

The Ae.C.F. Roll of Honour.

M. Henri Deutsch de la Meurthe presided at a general meeting of the Ae.C.F. recently, and opened the sitting by saluting the members who had fallen in defence of the Allies cause, and thereafter read out the Roll of Honour as follows :—Killed 82, wounded 34, missing 5, prisoners 24 (of whom 11 escaped during hostilities, and 5 were repatriated).

111 members were promoted in or named to the Legion of Honneur, 21 received the Military Medal, 367 were cited in the order of the day, and 184 members were promoted to superior rank.

Decisions of the French Government.

The French Government has decided to issue a "Livre d'Or" of Aeroplane Squadrons, detailing their records and war honours.

In order to teach the young men of military age a trade, and thus provide the Aeronautical Industry with skilled artisans in increasing numbers in a few years' time—in case the Industry experiences a period of stagnation—the Authorities have announced that youths of the 1919-1921 classes can enlist in the Aviation Corps (as non-navigating personnel) for four or five years. The French Aviation Corps is not composed in the same manner as the Royal Air Force or its progenitors. In France, in general, all men were already in the Army; thus, when it was necessary to increase the size of the Aviation Corps, men were transferred according to need and by their desire. Now, many of them are being returned forcibly to their original units, thus losing their proficiency pay.

F. T. N.

THE WORK OF THE ROYAL AERONAUTICAL SOCIETY IN 1918-19.

(Communicated by the Secretary, Mr. W. Barnard Farraday.)

In presenting the 54th Annual Report, the Council have pleasure in drawing attention to the prosperity and generally improved standing of the Society, which were such marked features of the report last year, and which can again be emphasised. The Society is continuing to grow in numbers and influence, so that every confidence may now be felt that it should have before it a great and prosperous future.

Title.

The Council are glad to have the honour to announce what is already well known to the members, that on June 25th, 1918, Sir William (now Lord) Weir, then Secretary of State to the Air Ministry, conveyed to the Society the information that His Majesty had been graciously pleased to confer on the Society the dignity of being henceforth known as the Royal Aeronautical Society in recognition of the Society's work.

Membership.

In January, 1918, the membership of the Society stood at 690, a considerable advance on the preceding year, but in January of the present year this figure had increased to 1,045. The Council considers that the fact that the membership has reached the figure of one thousand should be commemorated in a suitable manner together with the jubilee of the birth of the Society, which took place during the war. It is therefore proposed that an evening entertainment or conversazione should be given by the Society during the month of June, at a date to be named later.

Branches.

Progress has been made with the organisation of branches of the Society. The branch at Manchester is organised and has already held a number of successful meetings. In connection with this branch the College of Technology (University of Manchester) has arranged a course of lectures on aeronautics, which has been well attended. The Hendon branch has a large membership and is now completing its final arrangements. Members are requested to co-operate with the Executive of the Society in forming additional branches where the conditions in their own districts are favourable.

Increase in Council.

In consequence of the greatly increased work of the Society it was found desirable to increase the number of the Council, and accordingly on November 20th, 1918, Rule IV (6) was altered by resolution at an Ordinary General Meeting of the Society, increasing the number of the Council from 16 to 20. The members co-opted to fill the vacancies thus created were Lieutenant-Colonel Alan Burgoyne, M.P., Lieutenant-Colonel F. R. Cave-Browne-Cave, Brigadier-General Sir Capel Holden, F.R.S., and Major R. V. Southwell.

Conjoint Board of Scientific Societies.

In October the Society received an invitation from this Board to become one of its constituent societies. Major-General R. M. Ruck, C.B., C.M.G., R.E., was elected as the Society's representative on the Board for the current year.

The Technical Terms Committee.

This Committee has now completed the present stage of its work and presented its preliminary report. It should be observed that the difficulties of the questions involved was so great, in view of the wide divergencies in terminology existing among the various sections of the aero-technical world, that not only was the labour of the Committee enhanced, but the necessity of their issuing a report, even if only hastily completed, was made evident.

The Committee draw attention to the tentative nature of certain of their proposals. The Glossary prepared by the Committee is therefore issued as a working compromise. The Committee do not regard their work as finished, but will, as occasion arises, issue revised editions. The Committee have embodied in their Glossary a system of notation for use in aerodynamical calculations. This, after submission to the Advisory Committee for Aeronautics, was approved by them for issue as a provisional system on which comment is invited.

The Council desire to express their thanks to Lieutenant-Colonel O'Gorman and the other members of this Committee. The Committee has met weekly for a period of 18 months, and individual members devoted a great deal of time to the consideration of the various problems involved. The task was complicated by the differences of nomenclature which have grown up throughout the world, and as it was desirable to make the Glossary as international as possible much correspondence was involved. The Committee, as appeared in the last report, took its final form as the result of co-operation between the Society, the Engineering Standards Association, the American Advisory Committee on Aeronautics and the International Aircraft Standards Board of Washington.

The Members of the Committee.

The Committee as finally constituted was as follows:—

Chairman: Lieut.-Colonel M. O'Gorman, C.B., R.A.F. (Engineering Standards Association and R.Ae.S.).
L. Bairstow, F.R.S. (Royal Aeronautical Society and Air Ministry, Technical Department, Experiment and Research).
Lieut.-Colonel Briggs, R.A.F. (Royal Aeronautical Society).
W. Cannell (Society of British Aircraft Constructors).
Lieut.-Col. T. R. Cave-Browne-Cave, R.A.F. (Air Ministry, Airship Department).
Major T. G. Clarson (Air Ministry, Aircraft Equipment).
Captain A. C. Day, R.A.F. (Admiralty and War Office).
Captain A. F. C. Pollard, R.A.F. (Air Ministry, Technical Department, Instrument Section).
Captain F. M. Harding, R.A.F. (Air Ministry, Technical Department).
A. Winter-Moore (Air Ministry, Aircraft Equipment Department).
Major W. H. Ewen, R.A.F. (Air Ministry, Aircraft Equipment Department).
C. G. Grey (Royal Aero Club).
Lieut.-Colonel J. H. A. Landon (Air Ministry, Technical Department, Applied Design).
Major A. R. Low, R.A.F. (Royal Aeronautical Society).
R. Borlase Matthews, A.M.I.C.E. (Royal Aeronautical Society and Air Ministry, Technical Department, Applied Design).
Captain J. K. Mountain (Air Ministry, Aircraft Equipment).
Major Myers, R.A.F. (Air Ministry, Aeronautical Inspection).
A. S. A. Ormsby (Patent Office).
R. K. Pierson (Society of British Aircraft Constructors).
W. G. Renals (American Advisory Committee for Aeronautics).
F. J. Selby (Advisory Committee for Aeronautics and National Physical Laboratory).
Sir Napier Shaw, F.R.S. (Meteorological Office).
Captain Waters, R.A.F. (Air Ministry, Technical Department, Drawing Office).

To these individually the Council desire to offer their acknowledgments.

Civil Aerial Transport.

In the last report reference was made to the efforts which were being made by the Society to promote the cause of civil aerial transport. This movement has now attracted considerable attention, and is widely recognised as of the utmost national importance. The efforts of the Society have been continued during the past year, and three public lectures have been delivered on the subject under the auspices of the Society to very large audiences in the Central Hall, Westminster, by Mr. Holt Thomas, Brig.-General Lord Montagu of Beaulieu and Mr. C. Grahame-White.

In the first and last one of these the chair was taken by the Secretary of State to the Air Ministry for the time being, Lord Cowdray at Mr. Holt Thomas' lecture and General Sir John Seely at Mr. Grahame-White's. The Council offer their thanks to both chairmen and lecturers for their valuable help. In dealing with this subject one further remark may be made. For some time it had been feared that the termination of hostilities might be accompanied by a decline in the Society's membership as a natural result of the necessarily restricted output in the Aircraft Industry.

Fortunately this prediction has been falsified. The widespread and well-founded hopes for a great future in civil aerial transport which exist throughout the country have given the Society an increased hold upon the public and its numbers have continued to grow since the Armistice at possibly an enhanced rate. The great advance which took place in aeronautical science and industry is one of the benefits which we may claim from the Great War, and there is some satisfaction for the oldest aeronautical institution in the world in turning to the arts of peace the scientific knowledge which it developed and acquired in the terrible days of conflict.

The Council strongly urge the foundation of local branches of the Society in connection with this matter. Much might be done to further the introduction of civil aerial transport in this way by the encouragement of lectures and discussion on the subject.

Popular Lectures.

The Council understand that a certain number of members of the Society hold the view that there has been an undue proportion of popular lectures delivered during the past year. The Council appreciate the fact that there is much to be said in favour of their contention, but would point out that the times were unusual, that owing to the war there was a dearth of interesting technical matter which could be published and that the advent of civil aerial transport requires special attention of a popular nature to be devoted to it. With normal times there will be a return to the proper proportion of lectures, scientific and technical.

(To be continued.)

THE 1919 NEW YORK AERO SHOW.

By "Austerlitz."

The 1919 New York Aero Show—or, to use its full official title, the First Annual Aeronautical Exposition of the Manufacturers' Aircraft Association—which was held in Madison Square Garden and the 69th Regiment Armoury from March 1st to March 15th, was quite a remarkable event on several counts.

To begin with, it was the first aero show organised by the Manufacturers' Association—which corresponds in the U.S.A. to the S.B.A.C.—and this was quite an achievement in view of the sort of monopoly the Aero Club of America had hitherto exercised in such undertakings. It is murmured behind the curtains that this innovation, which it is proposed to continue in the future, was principally due to an aversion of most of the aircraft manufacturers against being dictated to by the Ae.C.A. in the best approved style of an Aeronautical Soviet. The little advance publicity the show received from the Ae.C.A. "authorities"—as they like to style themselves—seems to give some foundation to these gentle murmurs.

Another notable point about the show was that it was organised with a great amount of truly trans-Atlantic "hustle," which resulted in "putting over" the first post-war aircraft exhibition on the brethren in the League of Nations.

The Aerial Ford Pops Out.

However, this is by way of introduction only. The one really outstanding feature of the show was that it harboured four representatives of a type of aeroplane which cannot be more fittingly described than by calling it an aerial Ford. This novel trend in American aeroplane construction seems of more than passing interest, for it may foreshadow the direction which civil flying, as distinct from commercial aviation, will take in the U.S.A. in the near future.

The four 'buses referred to are characterised by the smallest size and power consistent with a possible sporting aeroplane, sufficient simplicity of design and the use of specially designed, low-priced petrol engines—which, it is claimed, can be repaired by any half-way intelligent automobile mechanic. Three of these machines, the Gallaudet "Chummy Flyabout," the Sperry "Sportplane," and the Dayton-Wright "Messenger," are land machines; the fourth, the Loening "Kitten," is a ship-plane designed for use on board small naval vessels, such as destroyers. Although the latter has not been designed for civilian use, it is included in this class because it seems to possess distinct possibilities for private flying over lakes, rivers, and the seashore.

In this family of "microplanes" the Gallaudet and the Sperry are undoubtedly the most original. Both proceed from the basic principle that the civilian flier of to-morrow will demand a reasonable amount of engine reliability, so that his power plant will not let him down at the most inopportune moment, say, over a large marsh, or a great wooded area. As a consequence, both 'buses embody the use of two engines; but while the Sperry is a twin-engine folding-wing machine having two airscrews, the Gallaudet has twin pusher screws which can be actuated by either engine or both.

The Gallaudet "Chummy Flyabout"—which a lady visitor to the show called the "cutest thing I have ever laid my eyes on"—is a monoplane of 33 ft. span, 18 ft. 7 in. length, and 5 ft. overall height, which is fitted with two 2-cyl. V-type 18 h.p. Indian motor-cycle engines (air-cooled), mounted in the nose of the fuselage. There is a clutch to each engine and a chain and sprocket transmission is used to carry the power to the two pushers, 48 in. in diameter, by means of a single transverse shaft fitted alongside the leading edge, which engages in its turn with two bevel gear shafts carrying the airscrews. The latter are almost flush with the trailing edge.

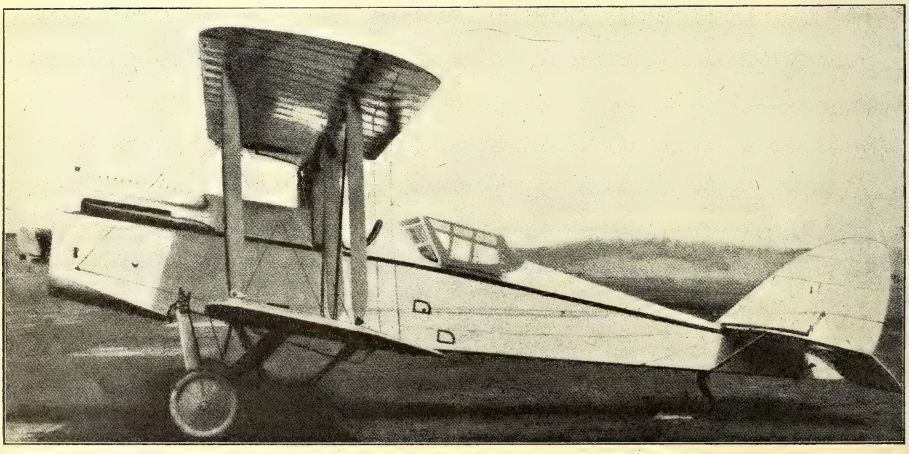
The machine sits very low on the ground, so low indeed that some people have taken the well streamlined body for a boat, and the machine for a seaplane; the belly of the fuselage extends below the wheel axle, and there is really very little clearance to the wheels but one presumes that this "Flyabout" is not supposed to cut capers over any countryside lacking adequate landing facilities. The machine seats two persons side-by-side, and weighs, empty, 600 lbs.; it carries 8 gallons of petrol, which is sufficient for a 2-hours' flight. The speed range is claimed to be 40-80 m.p.h.

The Sperry "Sportplane," which was not exhibited, though tentative wash-drawings were shown to visitors, is briefly an extreme reduction of a Handley Page. The span is 27 ft., but owing to the folding-wing arrangement this can be reduced to 21 ft.—which should prove quite a valuable feature for housing—while the overall length is 13 ft. 4 in. This machine is also a two-seater, and is fitted with two two-stroke 4-cyl. air-cooled De Palma engines which develop 37 h.p. each; the two airscrews are 5½ ft. in diameter. The weight, fully loaded, is 1,050 lb., empty, 576 lb., and the speed range is indicated as 36-88 m.p.h.

The Dayton-Wright "Messenger"—which is the product of the firm that was chiefly responsible for the manufacture of the Liberty DeH4's, on the value of which comment is rather varied, ranging from the "flaming coffin" to a "top-notcher"—is of much more conventional design. The "Messenger" is simply a very small single-seater tractor biplane, fitted with a De Palma 37-h.p. engine, and single landing and flying wires. These are probably its most outstanding features. The span is 10¼ ft., the overall length 17⅔ ft., the gross weight, 636 lbs., the useful load, 250 lbs. This machine carries petrol for 3 hours' flight, and has a speed range of 38-81 m.p.h.

As to the Leoning "Kitten," this seems to be the smallest seaplane in existence. Two models of this seaplane have been built for the U.S. Navy. The smaller is 19 ft. in span, 13 ft. in length, and is fitted with a 60 h.p. 3-cyl. air-cooled Lawrance engine—reminiscent of Anzani design—which drives a 6½ ft. tractor. Fully loaded the machine weighs only 500 lb., the useful load including, beside the pilot, fuel for 2 hours. The speed range is given as 50-100 m.p.h.

The main point of interest in this machine is that it is a monoplane, with the wings trussed to the undercarriage by means of steel tubes which act at the same time as ties and compression members, and the use of aluminium floats. These have been incorporated for the sake of light weight, and corrosion is prevented by a very copious use of grease. As the Loening "Kitten" has been built to the designs of the U.S. Navy Department (Aircraft Divison of the Bureau of Construction and Repair) it is at least



AN AMERICAN CIVIL AEROPLANE.—The Dayton-Wright "Honeymoon Express" (400 h.p. Liberty Engine).

MINISTRY OF LABOUR.

APPOINTMENTS DEPT.

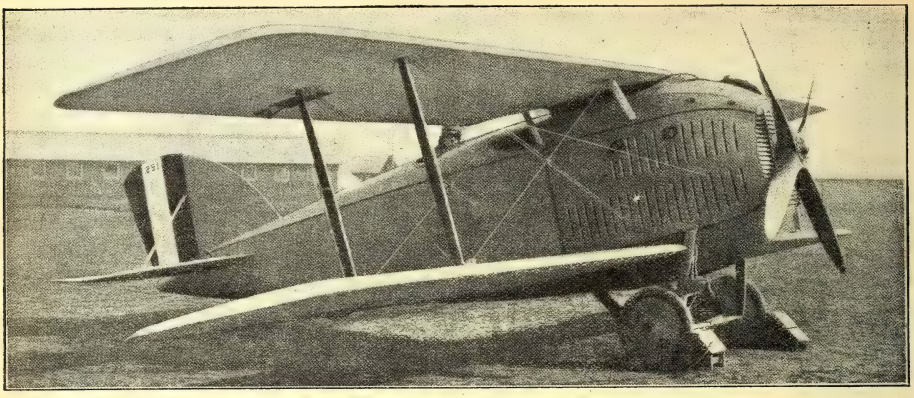


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In cases of doubt, or if any further or particular information or advice is required, such may be obtained at a special R.A.F. Branch of the Appointments Dept., established for this purpose. You are invited, therefore, after have registered at your District Headquarters, to apply to this Branch in the first case by letter. All communications should be addressed to :—

Room 238, APPOINTMENTS DEPARTMENT,
Ministry of Labour,
St. Ermin's Hotel, Caxton Street,
LONDON, S.W.1.



The Curtiss Model H.A. Biplane (375 h.p. K.12, Curtiss Engines).

interesting as indicating the trend of thought prevailing in those quarters with regard to ship-planes.

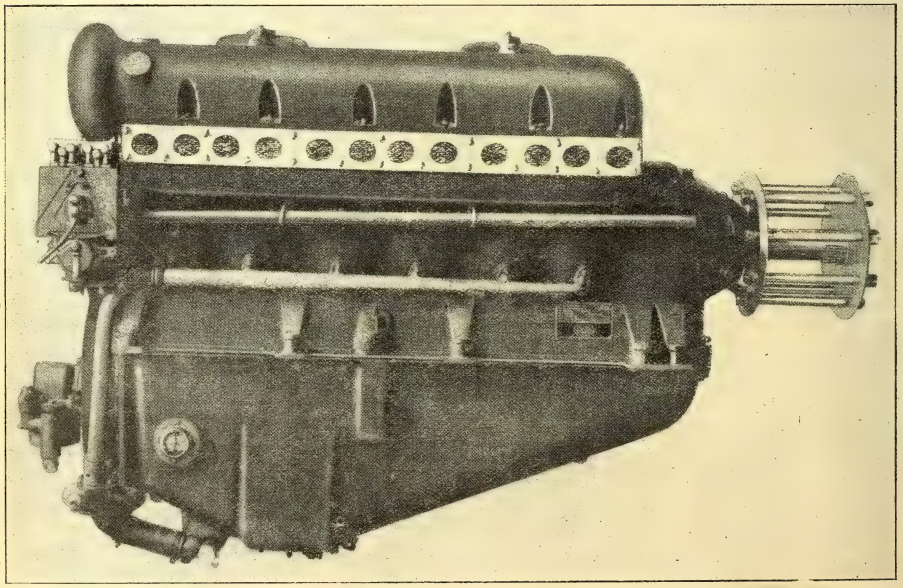
A High-Speed Single-Seater Fighter.

Among the military machines exhibited which display noteworthy performance is the Thomas-Morse model MB3 single-seater fighter, or "pursuit airplane," as the Americans call it; this is 26 ft. in span and is fitted with a model H Hispano-Suiza of 300 h.p., which has given the 'bus an extremely remarkable performance. The high speed, fully loaded, with the exception of 170 lbs. of military load, has in recent tests been 163.7 m.p.h., and the low speed, 55 m.p.h.; an altitude of 1,000 ft. was reached in 20 seconds, and 10,000 ft in 4 minutes 52 seconds. While this performance may be below the best of Europe, it is nevertheless noteworthy because the Thomas-Morse is the first single-seater fighter of original American design to put up a creditable show.

Another single-seater of high performance and most unusual design was exhibited at the show. This was the Christmas "Bullet" (described in the Feb. 19th issue of The Aeroplane), for which a high speed of 175-180 m.p.h. is claimed. Though this machine is undoubtedly very fast, its factor of safety is a matter of considerable conjecture, as the manufacturer has steadily refused to have the "Bullet" tested by sand-loading under the supervision of the Air Service, and has even refused to undergo such a test to ascertain a safety factor of 3 for the benefit of a civilian pilot. Furthermore, as the chief pilot of this company was killed in a test flight owing to one of the wings flying off, serious doubts prevail regarding the safety of the "Bullet." This notwithstanding, the machine was advertised at the show with a great display of flourish as the "fastest, safest, and most efficient airplane in the world," and attention was called to the fact how particularly desirable it should prove for mail carrying.

Pilots, be they military, naval, or postal, however, differ from this view, and have little liking for the lack of external truss which characterises the "Bullet," all the up and down loads being taken by the internal cantilever construction—which brings us back to the stay-less Antoinette monoplane of the French military trials of 1913. All of which goes to show that there is nothing new under the sun.

(To be continued.)



The 375 h.p. Twelve-Cylinder Curtiss Aeroplane Engine, Model K.12, shown at the New York Aero Show.

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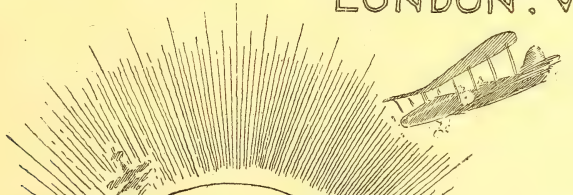
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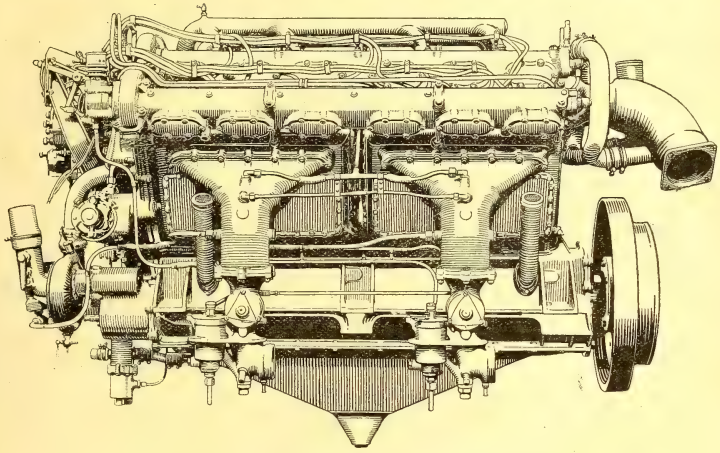
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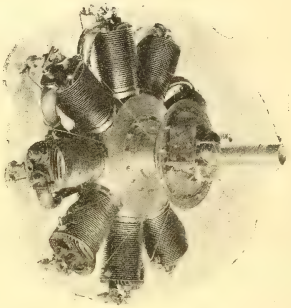


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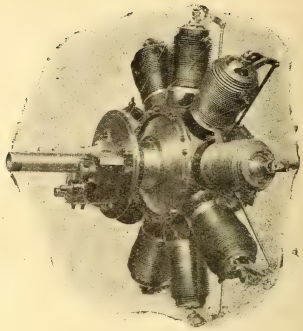
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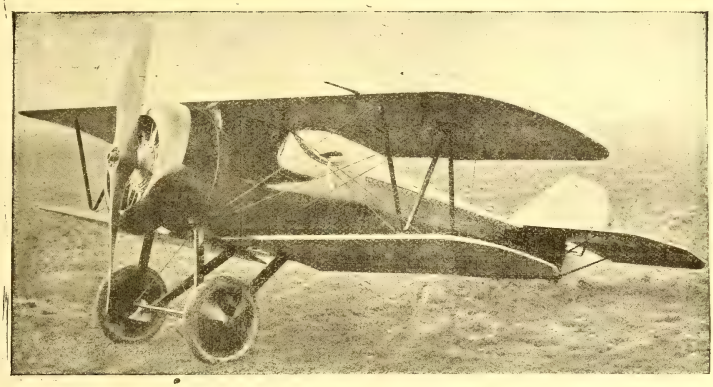
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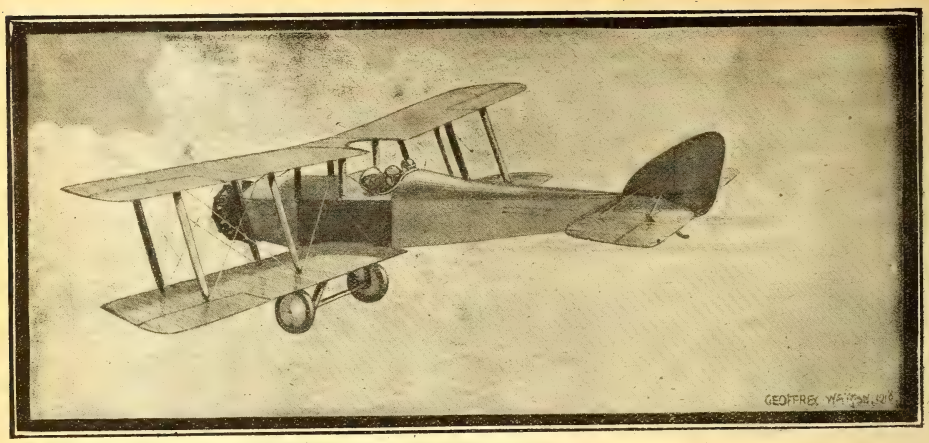
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THE WEEKLY COMMENTARY.

A description of the work of the Gallay Radiator Company in its relation to the development of radiators for aircraft engines will be found below.

Except by those who have carried out experimental work with differing types of radiators on aeroplanes, it may not be recognised how important an item in both the total weight and the total resistance of an aeroplane a badly designed radiator may become.

The description of the Bassè-Selve engine, which was commenced in the issue of April 9th, is concluded in this number.

The lubrication system presents features of considerable interest.

The compactly arranged oil cooler in the crankcase base and the very ingenious valveless oil pump are particularly worthy of attention.

The carburetter is of a type which has not been previously heard of as an aero-engine carburetter, though its general appearance is very similar to the "Pallas" carburetter, which is made by the Pallas-Zenith Company, of Charlottenburg, and is fairly widely advertised in the German Technical Press.

THE BRITISH AIRCRAFT INDUSTRY.—(*Second Series*).

By R. P. HEARNE.

XVI.—THE GALLAY RADIATOR COMPANY, LTD.

Keeping cool in war-time is an important aid to victory; and perhaps in some future war we may have a mechanical device for cooling the brains of politicians and Government officials in addition to the already existing appliances which keep our engines cool. Indeed, if some enterprising man like Mr. L. T. Delaney could supply radiators and cooling fins to the brains of the gentlemen at the Peace Conference they would speed up matters, and I feel sure that really effective cooling is the positive cure for the overheating which we call Bolshevism.

Radiation and Revolutions.

After all, the human machine is an internal combustion engine and the functional derangements which produce fevers, wars and revolutions are largely due to overheating. The human motor is in the main an alcohol motor, and on the day the ill-fated Tsar shut off vodka in Russia I said that there would be trouble. Sudden change of fuel is bad for any engine, and the idea of running a Russian moujik on dirty water is as bad as trying to cool an aero-engine by pumping water into the cylinders. The Russian peasant shied at water, went dry, heated up, seized, back-fired, and became a Bolshevist.

I am reminded that I am not writing a treatise on Bolshevism, and I come back to the theme of radiators, though my little excursion to Russia was merely intended as a demonstration of the importance of efficient cooling for man as well as motor. Temperature must be neither too high nor too low, and the science of radiator design is intended to give our engines greater efficiency. For the present we must leave the more difficult problem of cooling the human motor unsolved.

When the war opened we did not know very much about aero-engines in this country, and we knew still less about their efficient cooling. Our air triumphs would not have been possible if we had not made good these deficiencies, and the progress we have achieved in engine cooling is one of the technical triumphs of the war. Few people will ever realise how difficult the matter was.

Very luckily for us, we had men at hand of the type of Mr. L. T. Delaney, the managing director of the Gallay Radiator Company, which is the pioneer firm in this work. As Mr. Delaney is the brain, heart, and soul of the Gallay Company, I must say something about him first.

A Good Mixture.

I could write the whole article about Mr. Delaney's interesting personality, as may be gathered when I say that he is a Scotsman with an Irish name of French origin. A very rare blend this, and Mr. Delaney is a good testimonial for it. You find in him the shrewd and cool Scottish man of business, and there is also the versatility and sense of humour of the Irishman. From French ancestry he derives inventiveness, daring, and other good qualities.

So far back as 1898 he was busy with motors, and upon comparing notes with him I find that we were both tinkering with belt-driven Benz cars at about the same time. Mr. Delaney eventually went to France, where he obtained a practical training in motor engineering, his chief experience being in the shops of the famous de Diétrich and Delaunay-Belleville firms. He drove racing cars in many big events, including the great Paris-Madrid race of 1903, and his stock of quaint and exciting experiences is considerable.

Skipping the intervening years, we find him at the outbreak of war running armoured-car chassis from Paris to Dunkirk. Soon after that time he was quick to realise that aeroplanes would be needed urgently later on, and his connection with the radiator business showed him that the water-cooling of big aero-engines was a problem which had to be seriously considered. He was greatly interested in the developments already made in that remarkable engine, the Hispano-Suiza, and special attention was given to the study of the radiators fitted to the German aeroplane engines.

His firm was entrusted with the task of carefully investigating the cooling properties, weights, etc., of the Mercédès engine radiator on aeroplanes captured by the French, and as Mr. Delaney had a strong faith that the water-cooled engine was the motor of the future he was soon able to beat the best German radiator in efficiency, strength, and lightness.

Applying his skill and experience to British machines, he afterwards designed the radiator for the Sopwith Dolphin engine, the cooling apparatus of which weighed 21 lbs., and effectively cooled the 200-h.p. Hispano-Suiza motor.

A Practical Inventor.

Further on I shall deal with the work of the Gallay firm, but here I must mention that Mr. Delaney, in addition to his many designs of radiators for aero and car engines, has also taken out numerous patents for change-speed gears, trailers, and other odds and ends, and between whiles he has built up a great industry for the mass production of radiators.

At sundry spare moments he has soothed the fears and doubts of the Air Board and its descendants on cooling difficulties; he has taught not a few young cocksure theorists that experience is the best school; and, hurrying back from some official conference he has tackled the nice problem presented by a deputation of workmen who wanted a barrel of beer installed in the factory!

Diplomacy.

His Irish wit saved the situation here. He listened to the ultimatum—beer or bother. His sympathy inclined to beer, and he suavely agreed to the brewery tap in the works, provided that the men complied with the law and first obtained the Excise licence for the consumption of beer on the premises.

The deputation may have worked very hard with the Excise authorities, but that beer licence had not been obtained when the end of the war came.

I could tell several other good stories of Mr. Delaney's ready wit in dealing with obstreperous people, not all of them workers, be it remarked; but to enjoy these tales fully one should have them told by Mr. Delaney himself. How valuable his power of diplomacy is has been illustrated by the big output of radiators maintained by his factory throughout the war.

The First Radiators.

Turning now to the work of the Gallay Company we can trace the evolution of the radiator or water-cooling device. In the early motor-cars the radiator had hardly been thought about, and only a few firms like Panhard-Levassor had given any attention to the matter. The first step was the construction of a coil of light-gauge cycle tubing which was installed in a most inconvenient position underneath the car. This coil did not radically cool the water, but it prevented the fluid from being boiled away as rapidly as in the Benz system, which had only tanks without radiators.

Further progress resulted in gills being mounted on the coil of tubes, and thus we arrived at a radiator which actually prevented the water from boiling except under great stress, such as climbing long gradients.

A similar type holds good to the present day, and, although Messrs. Gallay supplied the Brazil Straker and other well-known firms with gilled tube radiators twelve to fourteen years ago, they are still making similar types with gilled copper tubes for 1919 cars.

For high-powered cars, however, it was obvious that an unsightly coil of tube was hardly the best way of carrying out the job, and the first solution of consequence was the Mercédès radiator of 1902, which revolutionised the cooling practice previously employed. The cost, however, was prohibitive, and in practice it was found that a good quality of light-gauge tube was difficult to obtain.



MR. L. T. DELANEY.

The Rhomboidal Radiator.

Messrs. Gallay made a careful study of the subject, and evolved a radiator which dispensed with the necessity of using small tubes. This radiator had the appearance of a nest of square tubes. Later developments and improvements resulted in the present Gallay patents for their rhomboidal system.

The measure of success obtained is shown by the Royal Aircraft Establishment report of November 13th, 1917. It is seen from this that one square foot of Gallay section dissipates 1,560 British Thermal Units per minute. The nearest approach to this was the round tube which, according to the Royal Aircraft Establishment report, gave a heat dissipation of 1,400 British thermal units per square foot, and was used as a standard of comparison.

The Useful R.A.E.

I was very pleased to find that Mr. Delaney has a high appreciation of the services rendered to his firm by the Royal Aircraft Establishment, as represented by its technical officers at Farnborough, who gave the Gallay Company every facility in carrying out most exhaustive tests, the results of which were placed at their disposal in order to guide them in their design of aircraft radiators. Mr. Delaney designed the radiators, which weighed only 21 lbs., supplied for Commander Dyott's "pre-Gotha" designs, and the Sopwith Dolphin, and he also carried out the confidential work for the new designs for most of our leading aircraft companies.

Post-Bellum Policy.

Messrs. Gallay were the first manufacturers to use one-piece casings, and he designed a radiator for Messrs. Peugeot which weighed little more than half the weight of their gilled-tube types.

The signing of peace will not interfere with the further progress of this enterprising firm, for with engines growing more and more powerful new problems are arising in radiator design and production.

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"A Text-Book of Aeronautics." By Herman Shaw, B.Sc., A.R.C.S., A.F.R.AeS. With a Foreword by Col. The Master of Semphill, R.A.F. Published by Chas. Griffin and Co., Ltd., Exeter Street, London, W.C.2, Price 10s. 6d. net.

Many years ago when—an infant in pants which failed by some inches to meet my socks—I struggled in vain correctly to write in the cursive script the simpler idioms of my native tongue, I was heartened in my endeavours by a sympathetic governess, who recited to me the story of one—long since dead—who had successfully written the Lord's Prayer on the back of a threepenny piece.

I vividly remember the fervid conviction that immediately shaped in my mind—that he had quite possibly made many mistakes—and that even the lynx eye of my governess would probably have failed to discern them all.

And I have even more recent memories of one—not the least of those who have influenced the technical progress of His Majesty's Aerial Forces during the past five years—who has frequently been heard to remark that "All such a one (naming some potent being with at least four gilded stripes) knows about—well, aeronautics, flying, engineering, or such like subject—could be written on a threepenny bit and then leave room for the Lord's Prayer."

AERONAUTICS ON THE BACK OF A THREEPENNY BIT.

Captain Shaw has not attempted to write all that he knows of aeronautics on the back of a threepenny bit.

But he has compressed considerably more than this into 253 pages of letterpress, plentifully besprinkled with illustrations, and I fear me greatly that my early impression as to the probable inaccuracy of so tightly compressed a transcript was completely justified.

Whether his work has any bearing on my once Commanding Officer's standing criticism of the technical qualifications of some of his colleagues I am not quite so sure—I rather fancy that it is a result thereof, and not to be regarded as an explanation.

In his preface Captain Shaw states that, when lecturing to R.N.A.S. and R.A.F. officers, no text-book of aeronautics was available, and that he was asked to recast his lecture notes into suitable form for the use of students.

The book covers the whole range from an outline of the principles of mechanics, though a brief statement of the general laws of fluid pressures, of air pressures and resistances, of the dynamics, the equilibrium, and the stability of the aeroplane, and finally deals with the construction and the design of aeroplanes.

AN INTRODUCTION—IN THE SOCIAL SENSE.

In dealing with aero-engines an introduction to some of the principles of thermo-dynamics is even attempted. It is, let it be said at once, an introduction in the purely social sense. It may leave the student with a name or two in his head—or it may not.

Aeronautical instruments, aerial navigation, meteorology, and aerial photography are all dealt with, and there is a chapter by Major N. B. Tomlinson, R.A.F., on "Wireless Telegraphy."

Frankly, it is difficult to deal with this work effectively. One is torn between a deep respect for Captain Shaw's industry and a deep distrust of his apparent versatility.

And as has been suggested already one can find quite good reasons for this distrust.

Very early one discovers a looseness of wording and a lack of precision in the exposition of ideas, as, for instance :—

Page 1, line 5, *et seq.* : "'Force' is anything which changes or tends to change the state of rest or of uniform motion of a body.

"(We shall choose as our unit of force the weight of one pound. The unit of force is therefore equal to the force which would just support a weight of one pound when hanging freely.)"

FORCE IS ANYTHING.

There is a certain fine spaciousness about that opening phrase, "Force is anything," which almost disarms criticism; but really it seems a little confusing, after defining force as emphatically an agent of change, to specify the unit of force in terms of an agent which apparently merely maintains a weight at rest.

Such matters are perhaps of little import. It is at least to be hoped that those who seriously contemplate the study of aeronautics will not proceed far along their path before divining the need for some better grounding in mechanics than Captain Shaw, or even the late Lord Kelvin, could provide in seventeen and a quarter pages.

But when one comes to aeronautics proper it becomes another matter. There is then a risk that he may be taken seriously.

And when one finds that he proceeds—dealing with air pressure —"To prove that pressure is proportional to V^2"—one feels that it is necessary to proceed with caution.

It is true that, having ostensibly proved this very debatable proposition, Captain Shaw qualifies it by the statement that "for very low speeds the variation in resistance is less than this, and for very high speeds it varies according to a higher power of the velocity than the square."

A WARNING TO THE STUDENT.

Conceivably this may be justified as a warning to the student against the fatal facility with which almost anything may be proved by neglecting any inconvenient factors.

Were it so meant, it would surely be better to clarify the exposition by some attempt to point out the incompleteness of the alleged proof.

As it is, it seems an excellent method by which to convince the average individual of the uselessness of mathematical processes. It is at least a partial explanation of the curiously inconsequent nature of the technical knowledge possessed by the average latter-day R.A.F. officer.

Again on page 85 :—

"... as the gliding angle of a machine is Tan$^{-1}\frac{D}{L}$, we see that, other things remaining unaltered, it is independent of the weight, which, at first sight, might appear astonishing.

Presumably by way of emphasising the astonishment on page 121 is the following :—

"In the case of aeroplanes, the need for engines of low weight per horse-power, and at the same time of low fuel consumption, is very pressing. The advantages to be gained from the use of such an engine are :—

"(1) Increased rate of climb.

"(2) Better gliding angle, due to the reduction of weight."!!!

CONTROVERSIAL POINTS.

Controversial points are disposed of by dogmatic statements—a simple method, but ineffective unless the author can rely on his own memory.

Briefly, one must suggest that, as an elementary text-book, this work is dangerous.

At the same time the author has collected in a small space a large amount of useful data. For those who have enough knowledge of the subject to separate the wheat of fact from the chaff of the author's explanations, the book may have some value, but—for the aeronautical infant—certainly not.—W. H. S.

Aeroplane v. Seapiane.

The following letter has been received :—

Permit me to reply to the letter from "Flight Sub., R.N.A.S.," in your issue of 26th ult.

I duly smiled at the witticism at my expense, and in regard to the question of the longest duration of flight for a freak machine, I thought it was common knowledge that it had been proposed to drop the land wheels, etc., in order to give extra fuel capacity and speed.

Regarding the "cream" of my letter, the question of tropical river transport, I might remind "Flight Sub." that tropical rivers are not only half a mile wide, but they are in some cases 20 miles wide a thousand miles from the sea—at any rate, in the case of the river I had in mind, the Amazon. They are more like a series of lakes.

No fear of side winds need be entertained, since there is usually little or no wind except during the progress of the daily thunderstorm, and in any case the river winds about considerably, as is usual with them. Again, the trees on the banks usually afford great protection from wind.

In my opinion there seems to be a very great future in these regions for aircraft capable of alighting on water, as suitable landing grounds are non-existent, as I said before. I refer to Africa and South America (Tropical).

It might interest "Flight Sub." to know that one firm at least are making arrangements for air transport on a large river, owing to the slowness of water transport, and very great saving will be made.

C. W. P.

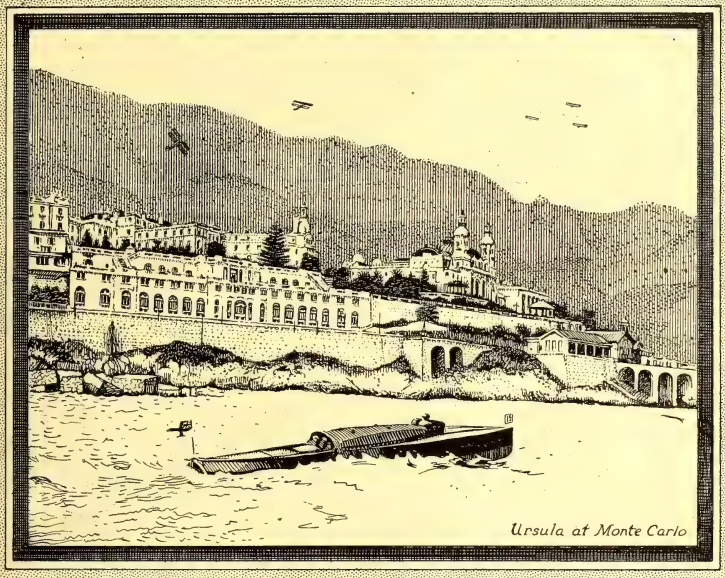
Floats for River Work.

As the waterplane is likely to become, as I have stated in print before, very successful in Italy, one would like to get a consensus of opinion upon suitable floats for river work. One has heard it said that those very handsome cigar-shaped floats with the two water-rudders at the back and blunt ends fitted to one of the most notable modern machines built here are not popular among pilots, possibly because they are ultra-efficient, so tricky, or because they allow too much lateral rolling.

Commander Mario Calderara, than whom few men here have had more experience of the action of floats, might give us a non-technical précis of the results of his tests. The deductions from some of his experiments, I am told, antedate principles first applied in France about the period when the early Nieuports came into being.—T. S. H.

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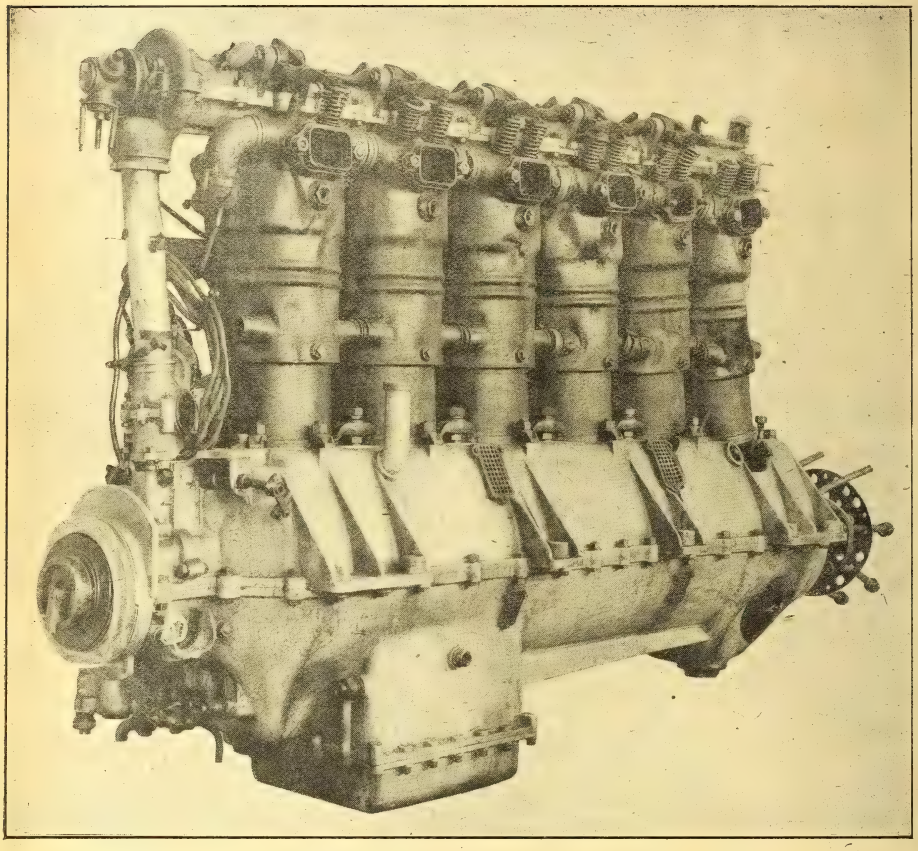
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Carburetters and Induction.

Unfortunately, only one incomplete carburetter was found on the engine. This is shown dismantled in a figure. The carburetters, which are quite separate, are of unusually light and simple construction compared with previous German design. The floats and float chambers are of the annular type, and encircle the main air intakes directly below the throttles, which are of the ordinary butterfly type. The body of each carburetter and throttle is made of cast aluminium, and the main jet is formed by a hole drilled in a tube which is screwed diagonally into the water-jacketed body of the carburetter, and lies across the choke tube directly beneath the throttle. The jet tube is open at the bottom end, and projects into the bottom of the annular float chamber, which is made of pressed sheet steel of very light gauge.

The pilot jet is formed by a second tube of small diameter inside the main jet tube. This pilot jet tube is also open at the bottom end, and is drilled radially with a small hole, just above the main jet. It communicates with the mixing chamber just above the throttle by a passage drilled in the carburetter body.

An altitude compensating control is fitted. This takes the form of a pipe opening into a passage drilled in the top of the float chamber, and no doubt connected by a rubber tube to a control cock in the pilot's seat.

Each carburetter feeds three cylinders through a branched induction manifold, the vertical part of which is water-jacketed.

The total weight of each carburetter complete should not exceed 2 lbs.

Crankcase.

The design of the top half of the crankcase requires no description, being constructed on Mercédès lines; it is shown in the engine photographs. The lower half also closely follows standard Mercédès design, with the exception of the oil reservoir and oil-cooling radiator on the bottom of the rear end. The construction of this cooler may be seen in a photograph. It consists of a cast aluminium oil chamber, having a number of thin aluminium tubes (12 mm. diameter) running longitudinally in three rows, and expanded at the ends. The cooler is bolted to the bottom flange of an oil reservoir below the base chamber, and is not an oil sump, inasmuch as there are no oil connections between it and the base chamber. This oil reservoir and cooler is provided for the purpose of forming the service oil tank, and for cooling the oil on the scavenger circuit; separate oil sumps are provided at each end of the base. (See notes on Lubrication.)

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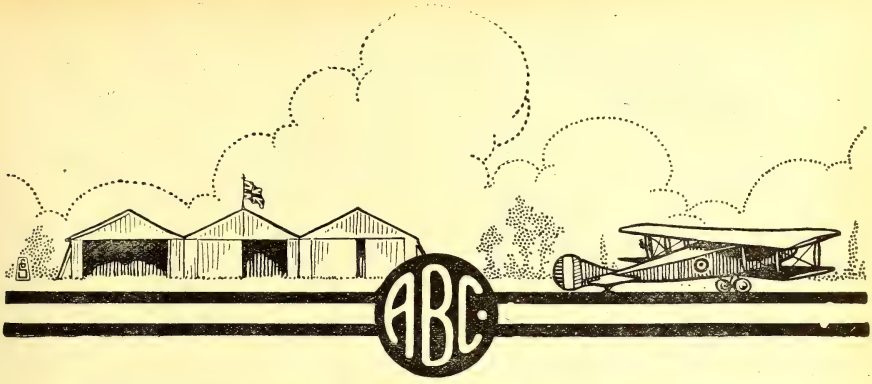
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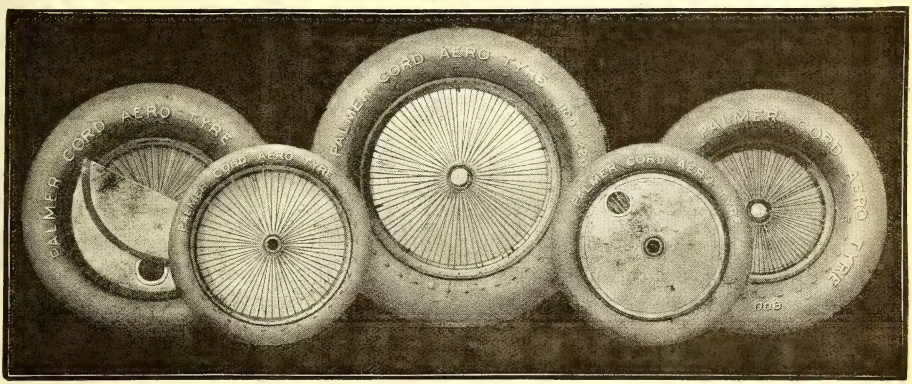
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450×60	30	89.	31.75	Central	700×100	77	178.	44.45	132/46	1000×150	102	185.	55.	125 60
,,	138	130.	38.09	Central	,,	92	185.	55.	135/50	,,	201	185.	60.32	125/60
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575×62	21	160.	28.	Central	,,	96	178.	55.	132/46	,,	210	185.	60.32	Central
,,	34	150.	31.75	104 46	,,	99	178.	38.89	132/46					
,,	111	150.	38.09	104 46						900×200	107	185.	55.	Central
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650×65	78	178.	44.45	132 46						,,	128	220.	66.67	Central
,,	79	178.	44.45	Central	750×125	77	178.	44.45	132/46	,,	202	185.	60.32	Central
,,	100	178.	38.09	132 46	,,	92	185.	55.	135/50	,,	208	185.	60.32	125/60
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600×75	21	160.	28.	Central	,,	99	178.	38.89	132/46	,,	136	250.	80.	Central
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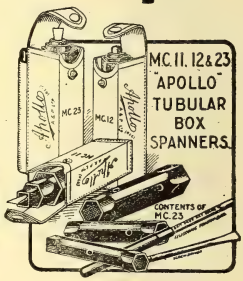
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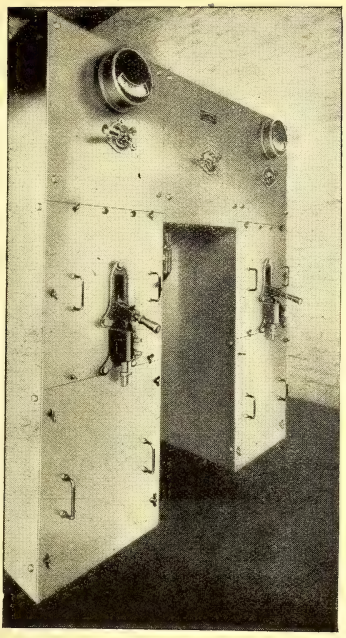
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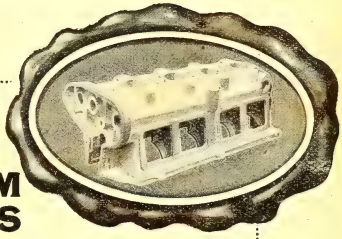
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Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4670.

Casein—

T. M. Duché & Sons, 6, Eastcheap "Duché, London." Avenue 2006.

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricodon, Fen, London." Avenue 34 and 35.

Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1306-7.

Clothing—

Burberry's, Ltd, Haymarket, S.W.1. Regent 2165.

Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, 'Phone, London." Hampstead 4403 & 4404.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Aeros, Richmond." Richmond 1681.

The Sneregold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Snercold, Kingston-on-Thames." Kingston 1154.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England "Thompson Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 4046.

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 440.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1910.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London." Gerrard 8926.

Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1. "Rolhead, London." Gerrard 1654-5-6.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 985.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames." Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1984.

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London" Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 981.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London." Willesden 2480.

Electric Cables—

E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 242.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Fluxes—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

· Buyers' · Guide.



Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Flying School—
The L. & P. Aviation Co., Stag Lane Aerodrome, Edgware. Kingsbury 102.
Avenue 995, 996, and 7996.

Furniture (Office)—
Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2.
London Wall 573 and 6170.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

Glue—
Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Bececolin, Cannon, London."
City 1206.
Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid.) "Excroiden, Phone, London." Avenue 4611-2.
Mendine Co., 8, Arthur Street, E.C.
Bank 5873.

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Hack Saw Blades and Machines—
Victor Saw Works, Ltd., 2 and 3, West Street, Finsbury Circus, London, E.C. "Vicsaw, Phone, London."
London Wall 1880.

Heating and Ventilating—
Chas. P. Kinnell and Co., Ltd., 65 & 65a, Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London."
Hop 763.

Hollow Spars—
McGruer Hollow Spar Co., Ltd., Commercial Road, Lambeth, S.E. "Ollosparsh, Watloo, London" Hop 718.

Instruments—
British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

Leather for Aeroplanes—
George Angus & Co., Ltd., Newcastle-on-Tyne. City 72. Central 956-7. Quayside City 73.

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London "Pegamoid, Cent., London." City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—
W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines.)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, Phone, London."
Museum 430.
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asteroidal, Coventry." Coventry 278.
The M.I. Magneto Syndicate, Ltd., Coventry. "Corlton, Coventry."
Coventry 1008-1009.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 599 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43.
Avenue 1432.

Metals in General—
Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.
Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London."
Avenue 995, 996, & 7996.

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury."
Oldbury 111 (4 lines)
Aircraft Supplies Co., Ltd., Ascot House, 125, Long Acre, W.C.2. "Upcast, Rand, London." Gerrard 276 (2 lines).
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds."
Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1 "Installing, Busroad, London." Museum 70.
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London."
Holborn 410
The Smercold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Smercold, Kingston-on-Thames." Kingston 1154.
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London."
Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros, Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast."
Belfast 4033-4934-4035.
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London."
London Wall 6306.
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham."
Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow Tapes, Cords, and Threads. City 3115.

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Busroad, London." Museum 79.
Standard Motor Co., Coventry. "Flywheel, Coventry."
Coventry 530 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—
C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London." Central 11305 & 13406.

Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemaliwo, Ave, London." London Wall 3266-3267.
C. G. Spencer & Sons, Ltd.
(See under "Balloons").

Piston Rings—
British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 1723.
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds."
Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Propellers (continued)—
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames "Ebora, Kingston." Kingston 672.
Integral Propeller Co., Ltd., "Aviprop, Hyde, London."
Hendon 9. Kingsbury 104
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich."
Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.
The Pegasus Aircraft Co., Ltd., Totterdown Street, Tooting, S.W.17.
Streatham 1242.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 26

Radiators—
Gallay Radiator Co., Ltd., 198, Great Portland Street, W.1 "Galyradico, Wesdo, London." Mayfair 4826.
John Marston, Ltd., Sunbeamland, Wolverhampton. "Sunbeam, Wolverhampton."
Wolverhampton 46 and 206.

Rawhide Hammers—
Ira Stephens, Whitelands Leather Works, Ashton under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield."
Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 206, Goswell Road, London, E.C.1 "Masticator, Islinc, London." City 3811 & 3812.

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester."
City 4432.

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch."
Redditch 74.

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds."
Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich."
Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton."
Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 7540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London."
Willesden 2480.

Shackles—
British Gold Shell Ring Co., Ltd., Hounslow, Middlesex. "Golshel, Hounslow." Hounslow 254.

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury."
Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds."
Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Diamma, Vic, London." Vic 4830.
British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London."
Regent 1181.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).
The Smercold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Smercold, Kingston-on-Thames."
Kingston 1154.



The Aeroplane

Acceptance and Experimental Flights—

The Prodger-Isaac Aviation Company "Aeromnia, 'Piccy, London" Gerrard 278 (2 lines).

Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic 3540 (3 lines).

Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 220.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle - on - Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 1066.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hamnstead 5551.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hmnpstead 1495 and 4424.

Davidson Aviation Co., Ltd., Hammersmith, W.6. Hammersmith 1692 (3 lines).

Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2604 (2 lines).

Eastbourne Aviation Co., Ltd., Eastbourne "Aircraft, Eastbourne." Eastbourne 1170.

Glendower Aircraft Co., Ltd., 54, Sussex Place, South Kensington, S.W.7. "Glenacelle, Southkens, London." Kensington 3605 (3 lines)

Gosport Aircraft Co., Gosport. "Flight Gosport." Gosport 217.

Graham-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120. London Office, 12, Regent Street, S.W.1. Regent 2684.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophid, Crickle, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St. James, London." Regent 912.

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet, "Martinsyde, Weybridge." Woking 331, Byfleet 171.

National Aircraft Manufacturing Co., Ltd., 15, Drummond Crescent, Seymour Street, Euston. "Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London." Willesden 2455.

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8510-8511, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 191.

Short Bros., Rochester, Eastchurch and Whitchall House, S.W. "Tested, Phone, London." Regent 378.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 1988 (8 lines).

Standard Aircraft Manufacturing Co., 28, Bow Common Lane, E. East 2823.

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin" Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey "Tarrant, Byfleet." Byfleet 1, 2 & 3.

Thames Aviation Works, 141, Curtain Rd., E.C.2. London Wall 9766.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyta, Knights, London." Kensington 6816.

Waring & Gillow, Ltd., Hammersmith "Warisen, Ox, London." Museum 5000.

Westland Aircraft, Yeovil "Aircraft, Yeovil" Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes" Cowes 1.

Aeroplane Manufacturers (continued)—

Whitehead Aircraft (1917), Ltd., Richmond, Surrey. "Whitecraft, Richmond, Surrey." Richmond 1780-1.

Witton & Witton, 143, Fonthill Road, Finsbury Park, London, N.4. North 2110.

Airships—

Airships, Ltd., High Street, Merton. Wimbledon 1314.

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 378.

C. G. Spencer and Sons, Ltd. (See under "Balloons").

The Willows Aircraft Co., Ltd., Cardiff. "Aircraft, Cardiff." Cardiff 300 (main line).

Aluminium Castings (Sand and Die)

Cean, R. W., 210, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 3846.

The Sneregold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Snercold, Kingston-on-Thames." Kingston 1154.

Balloons—

C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronaut, London."

Bent Timber Parts—

Dalston 1893.

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Euspuare, London." Museum 496. Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 15.

Bearings (Etonia Cast Phosphor Bronze)

Brown Bros., Ltd., 61, Eastern St., E.C.1. Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds."

Blinds—

Central 3927.

J. Avery & Co., 81, Gt. Portland Street, London, W. "Velarium, London." Gerrard 6620.

Blowpipes (Oxy-Acetylene)—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic 3540 (3 lines).

Bolts—

Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16. Dalston 2500 (2 lines).

Books (Aero Engines)—

Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2.

Buildings—

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Rubery Owen & Co., Darlaston, South Staffs.

Cable Coverings and Cable Controls—

The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green." Acock's Green 103 & 104.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4670.

Casein—

T. M. Duché & Sons, 6, Eastcheap "Duché, London." Avenue 2006.

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricodon, Fen, London." Avenue 34 and 35.

Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 13366-7.

Clothing—

Burberry's, Ltd., Haymarket, S.W.1.

Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 5405-6.

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, 'Phone, London." Hampstead 4403 & 4404.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Aeros, Richmond." Richmond 1681.

The Sneregold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Snercold, Kingston-on-Thames." Kingston 1154.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England "Thompson Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. "And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafrex, Piccy, London." Gerrard 2112.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellulate, London." Regent 4091.

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 44.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford "Potnp, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Beardmore Aero Eng., Ltd., 113, Great Portland Street, W.1. "Beardmore, London." Gerrard 2.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol Bristol City 1266.

Dudbridge Iron Works, Ltd (Salmson), 57, Victoria Street, London, S.W.1. "Aeroflight, Vic, London." Vic 2028.

Gordon Watney & Co., Ltd., Weybridge "Mercédès, Weybridge" Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham Richmond 1293.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1070.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London." Gerrard 2929.

Rolls-Royce, Ltd., 13 and 15, Conduit Street, W.1. "Rolhead, London." Gerrard 1634-5-6.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton "Moorfield, Wolverhampton" Wolverhampton 685.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames" Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottham 1084.

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7 "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London" Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 260, Bradford Street, Birmingham. "Fahrenheit, Birmingham" Midland 981.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, - London." Willesden 2480.

Electric Cables—

E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 248.

Johnson & Phillips, Ltd., Charlton, London, S.E.7 "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W. "Installing, Eusroad." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch "Springs, Redditch." Redditch 61.

Fluxes—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

The Auto Controller Co. (Fluxite), Victoria Road, Bermondsey, Eng



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Flying Boat Builders—

Gosport Aircraft Co., Gosport. "Flight, Gosport" Gosport 217.

Flying School—

The L. & P. Aviation Co., Stag Lane Aerodrome, Edgware. Kingsbury 102. Avenue 995, 996, and 7996.

Furniture (Office)—

Cooke's (Hinsburg), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6170.

Galvanising—

Boulton & Paul, Ltd., Rose Lane, Norwich "Aviation, Norwich." Norwich 851.

Gauges—

J. A. Prestwich & Co., Northumberland Works, Tottenham, N.17

Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall" Walsall 0166.

Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham" East 407.

Glue—

Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Beccocoffin, Cannon, London." City 1266.

Improved Liquid Glues Co., Ltd., 61, Gt. Hermitage Street, E. (Croid.) "Excroiden, 'Phone, London." Avenue 4011-2.

Mendine Co., 8, Arthur Street, E.C. Bank 5873.

Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London" Regent 1140.

Hack Saw Blades and Machines—

Victor Saw Works, Ltd., 2 and 3, West Street, Finsbury Circus, London, E.C. "Viesaw, Phone, London." London Wall 1880.

Heating and Ventilating—

Chas. P. Kinnell and Co., Ltd., 65 & 654, Southwark Street, London, S.E.1. "Kinnell, London" Hop 372 (2 lines).

The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 793.

Hollow Spars—

McGruer Hollow Spar Co., Ltd., Commercial Road, Lambeth, S.E. "Ollospairsh, Watloo, London" Hop 718.

Instruments—

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

Leather for Aeroplanes—

George Angus & Co., Ltd., Newcastle-on-Tyne. City 72 Central 956-7 Quayside City 73.

Leather Cloth—

New Pegamoid, Ltd., 134, Queen Victoria Street, London "Pegamoid, Cent., London" City 0704 (2 lines).

Lubricating Oil Refiners and Merchants—

W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines).

Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—

The British Lighting & Ignition Co., Ltd., 264, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 430.

The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asterophil, Coventry." Coventry 278.

The M.L. Magneto Syndicate, Ltd., Coventry. "Corlton, Coventry." Coventry 1008-1009.

Metal Casement Manufacturers—

Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham" Central 599 (2 lines).

Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham" Central 42-43. Avenue 1432.

Metals in General—

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6142.

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London" Avenue 995, 996, & 7996.

Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Aircraft Supplies Co., Ltd., Ascot House, 125, Long Acre, W.C.2. "Upcast, Rand, London" Gerrard 276 (2 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207

Bayliss, Jones, & Bayliss, Ltd., Wolverhampton (Bolts and Nuts.) "Bayliss, Wolverhampton" Wolverhampton 1041

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London" Museum 70.

Rubery Owen & Co., Darlaston, South Staffs.

Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvapult, Phone, London" Holborn 410.

The Sneregold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Snercold, Kingston-on-Thames." Kingston 1154.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selvero, Phone, London." Regent 1181.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston" Bilston 10.

Metric Bolts—

Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast "Anderson, Belfast" Belfast 4033-4034-4035.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London."

Herbert Frood Co., Ltd., Chapel-en-le-Frith "Frodobrake, Birmingham" Central 793.

MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow Tapes, Cords, and Threads. City 3115.

Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 279/281, Euston Road, London, N.W.1. "Manegecar, Eusroad, London." Museum 79.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 630 (4 lines).

Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1140.

Oils—

C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London." Central 11305 & 13476.

Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Sowindive, Ave, London." London Wall 3366-3267.

C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—

British Clinch & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield" Sheffield 2149.

Presswork—

Rubery Owen & Co., Darlaston, South Staffs.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

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Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames "Ebora, Kingston" Kingston 672.

Integral Propeller Co., Ltd., "Aviprop, Hyde, London." Hendon 9 Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20542-8.

The Pegasus Aircraft Co., Ltd., Tetterdown Street, Tooting, S.W.17 Streatham 1242.

Westland Aircraft, Yeovil. "Aircraft, Yeovil" Yeovil 129.

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The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 20.

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Gallay Radiator Co., Ltd., 168, Great Portland Street, W.1. "Galyradico, Wesdo, London." Mayfair 4820.

John Marston, Ltd., Sunbeamland, Wolverhampton. "Sunbeam, Wolverhampton" Wolverhampton 40 and 266.

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Ira Stephens, Whitelands Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton." Ashton 709.

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Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield" Wakefield 366.

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Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch "Inventors, Redditch" Redditch 74.

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Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 482 (4 lines).

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).

Short Bros., Rochester "Seaplanes, Rochester" Chatham 627.

Supermarine Aviation Works, Ltd., Southampton "Supermarin, Southampton" Woolston 37.

Searchlights & Landing Lights

Brown Bros., Ltd., Great Eastern St., E.C.1.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London" Vic 3540 (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London" Willesden 2480.

Shackles—

British Gold Shell Ring Co., Ltd., Hounslow, Middlesex. "Goldshel, Hounslow." Hounslow 254.

Sheet Metal Pressings—

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British Metal (Kingston), Ltd., Kingston-on-Thames.

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Sheet Metal Work—

The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London" Vic 4830.

British Metal (Kingston), Ltd., Kingston-on-Thames Staffs.

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The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selacro, Phone, London." Regent 1181.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

The Sneregold Engineering Company, Ltd., Vicarage Road, Hampton Wick, Middlesex. "Snercold, Kingston-on-Thames." Kingston 1154.

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Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Sparking Plugs—
Brown Bros., Ltd., Great Eastern St., E.C.1
Lodge Sparking Plug Co, Ltd., Rugby. "Igniter, Rugby." Rugby 235.
Ripault, Leo., & Co., Ltd. (Oleo Plugs) 649, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Robinhood Engineering Works, Ltd., Newlands, Putney Vale, S.W.15. Makers of KLG Plugs. "Kaelgec, Phone, London." Putney 2132-3

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Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.
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Timber—
Brown, R. F. & F. W., Wollaton, near Nottingham. Nottingham 1526.
Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London." Museum 490.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Time Recorders—
Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—
Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349

Turnbuckles—
Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery Owen & Co., Darlaston, South Staffs.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston road." Museum 70 (4 lines).

Tyres and Wheels—
The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—
Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

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The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjap, Phone, London." Mayfair 6347 (5 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—
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Watchmakers and Jewellers—
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Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.
Imperial Light, Ltd, 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Welding Repairs—
Imperial Light, Ltd, 123, Victoria Street, London, S.W.1. "Edibrac," Phone, London." Victoria 3540 (3 lines).

Wind Shields—
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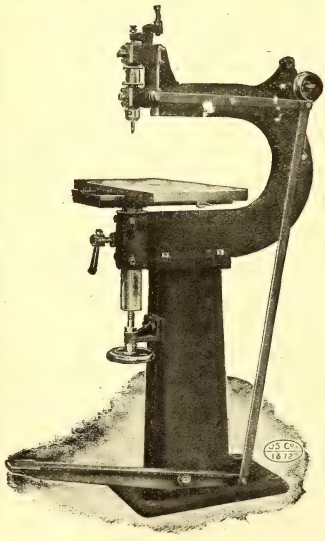
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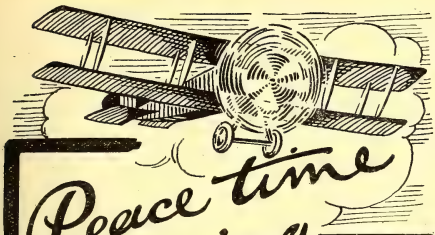
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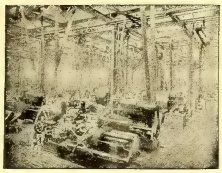
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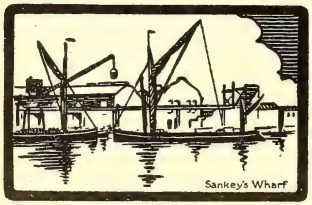
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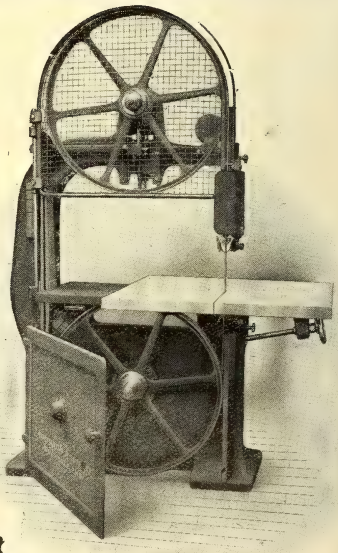
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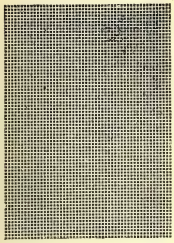
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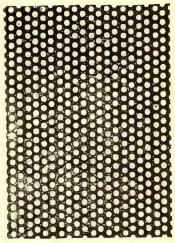
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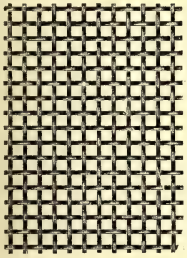
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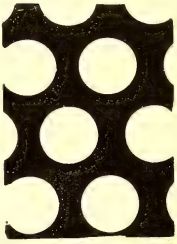




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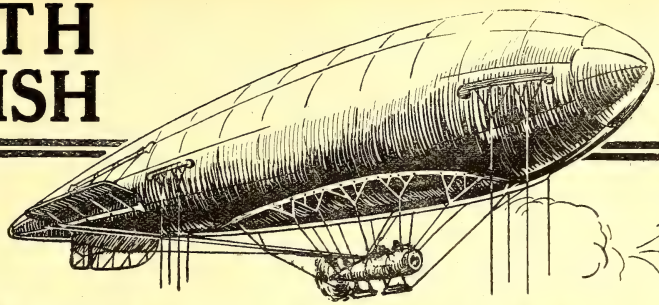
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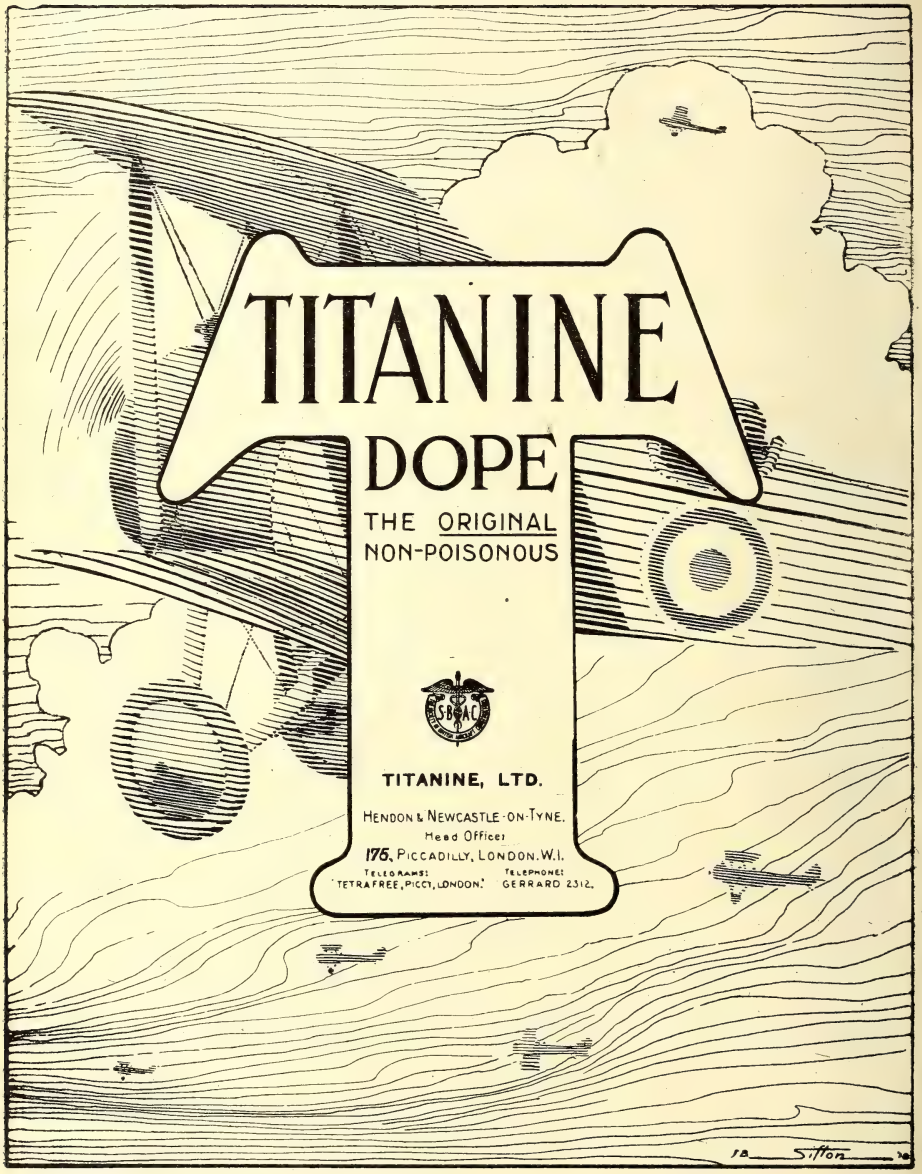
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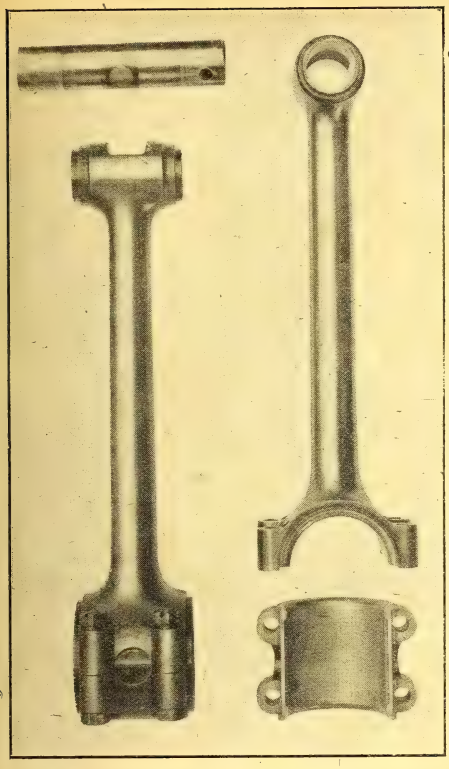
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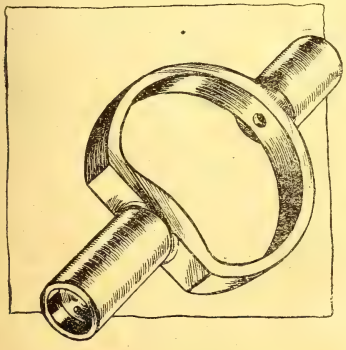


Connecting Rods and Gudgeon-Pin, 270-h.p. Bassé-Selve Engine.

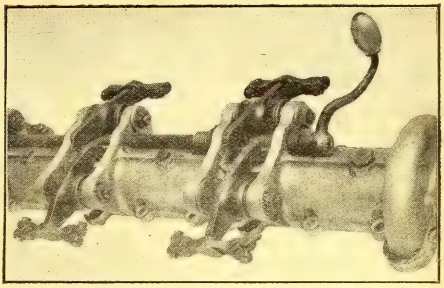
cooler a passage cast in the side of the base chamber communicates with the space between the transverse webs of the main bearing housings.

At the bottom of the crank chamber a trough is formed in the casting. This is semi-circular in cross section, and is provided to take the main oil supply and return pipes.

Two air intake passages are cast on each side of the crank chamber (see photograph); they are arranged to communicate with the carburetter through passages in the top and bottom halves between the transverse box-housings of the main bearings.



Sketch of a Valve Tappet, Bassé-Selve Engine.



The Exhaust-Valve Lifting Gear.

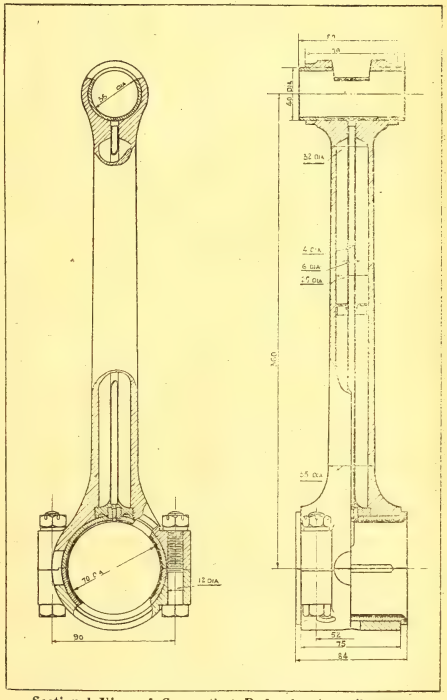
Oil Pump and Lubrication System.

The oil pump is attached to the bottom half of the crankcase at the rear end, and driven by a worm gear off the rear end of the crankshaft through a short transverse layshaft.

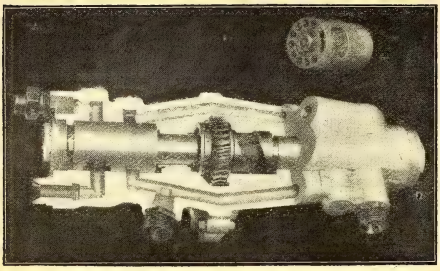
Most of the details of construction of the oil pump may be seen in the photograph of the pump, which has been specially sectioned to show as much as possible of the various oil passages, ports and connections.

The pump consists of two double-acting steel plungers, which work vertically in the barrels formed in the ends of the cast aluminium pump body. In action, the plungers are rotated by means of the worm gear, and are simultaneously reciprocated by the action of the scroll-cam cut in the spindle, and operated by a hardened steel roller working on a pin screwed into the pump body.

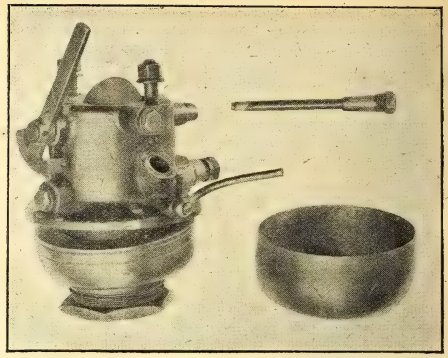
At every stroke of the two double-acting plungers, oil is drawn



Sectional View of Connecting Rod—showing oil passages.



Photograph of the Bassé-Selve Oil Pump sectioned, showing the spiral groove which reciprocates the pistons, and the oil passages in the body.



Photograph of the Carburetter of the Bassé-Selve Engine. This carburetter appears to be of a type known in Germany as the "Pallas" and manufactured by the German makers of the "Zenith" carburetter.

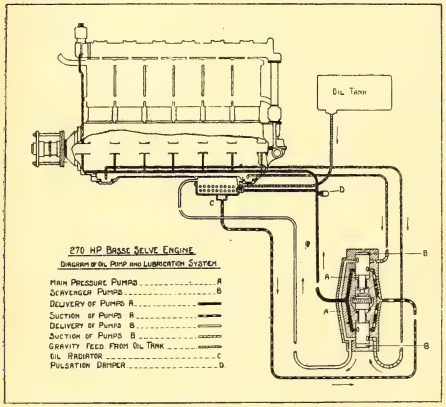
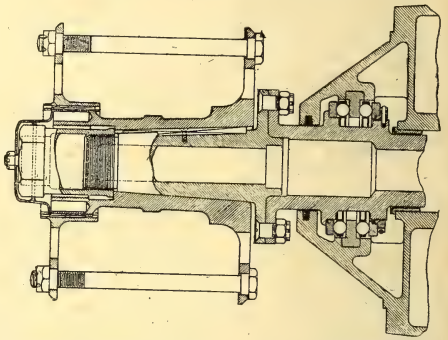
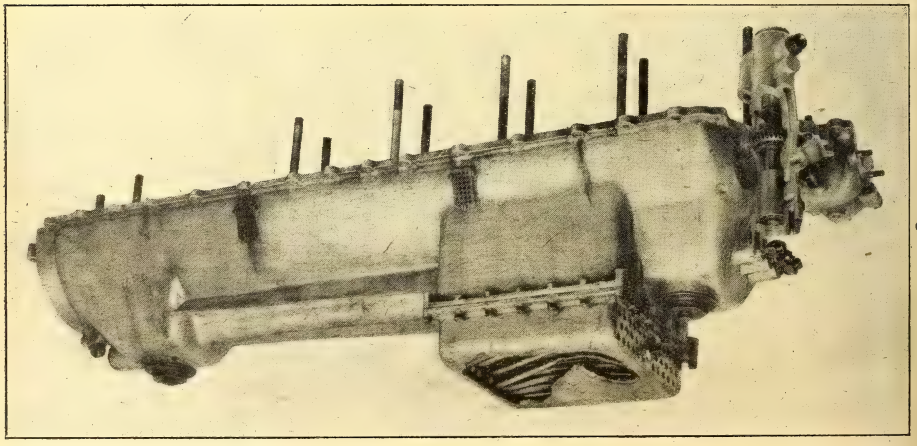


Diagram of the Lubrication System.



Section of the Airscrew Hub, and of the thrust-bearing of the Bassé-Selve, showing clearly the coupling between the crankshaft and the separate nose-piece.



Lower Half of Crankcase, showing the Oil-cooler, Oil-pump in Position, and the Air Vents in Crankcase-side. 270-h.p. Bassé-Selve Engine.



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from the cooler tank and sumps in the base chamber, and is delivered to the main bearings and camshaft or returned to the oil cooler respectively, through the four distributing ports in the pump plungers. These ports when in action coincide with the drilled passages in the body casting of the oil pump, which are connected to the various leads as shown in the lubrication diagram.

The functions of the oil pumps and circuits are as follows :—

1. Main Pressure Circuit, by the two inner pumps to crankshaft and connecting rod bearings and also to the hollow camshaft, returning by gravity to the two sumps at either end of the base chamber. The oil for this circuit is drawn from the supplementary oil cooler tank, which is replenished by fresh oil from the service oil tank.

2. Scavenger Circuit.—Oil is drawn by the two outer pumps from the two oil sumps in the bottom of the base chamber, and is returned to the oil cooler.

The total weight of the oil pump complete is 5 lbs. No details can be given of the construction of the water or air pumps, which were missing from the engine examined. The water pump, however, was evidently driven by the short transverse shaft which drives the oil pump at the rear end of the engine. This shaft is situated directly underneath the floating distribution bevel gear on the rear end of the crankshaft, as shown in the general arrangement drawing of the engine, in which the oil pump, for the sake of clearness, is drawn on the exhaust side of the engine. The air pump, which was driven by a small crank fixed in the front end of the camshaft, was probably similar in design to the 260-h.p. Mercédès, and is shown thus in the general arrangement.

Ignition.

Ignition is by two Z.H. 6 magnetos, which are driven obliquely to the crankshaft axis by bevel gears off the camshaft driving spindle at the rear end of the engine.

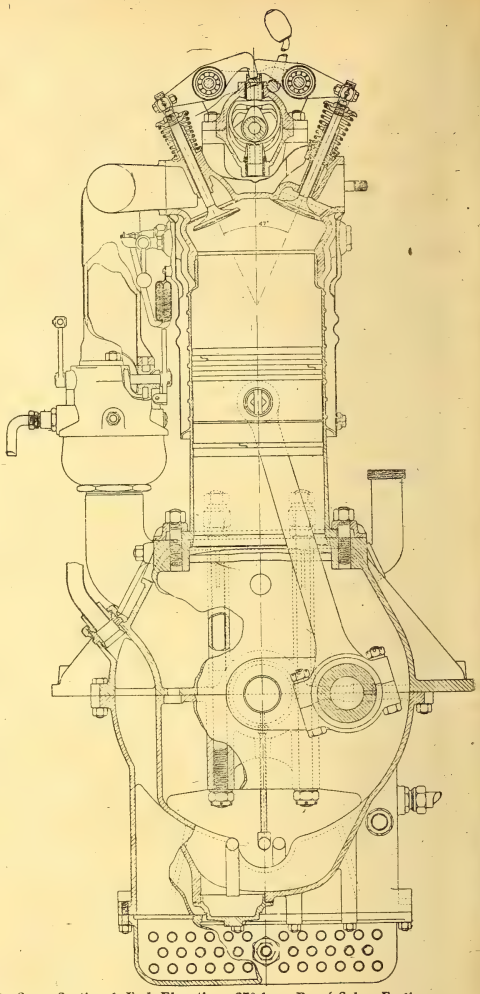
Two Bosch 3-point plugs are fitted to each cylinder, and are situated just below the induction valves. Provision is also made for fitting one sparking plug on the exhaust side of the cylinders, the holes not in use being plugged.

The H.T. cables are carried in fibre tubes attached to the cylinders.

The machine-gun interrupter-gear triple drive is bolted to the camshaft bevel gear case, and is driven off the rear end of the camshaft as shown in Fig. 2. The wireless dynamo is driven off the rear end of the crankshaft by a standard type of friction-clutch belt pulley described in a previous report.

General Analysis of Weights.

Description of Part.	No. per Set.	Average Unit Wt. lbs.	Wt. of complete Set lbs.	Percentage of Total Wt.
Cylinders (bare)	6	35.67	214.05	24.20
Pistons, with rings	6	5.18	31.12	3.51
Gudgeon pins	6	1.00	6.00	0.68
Connecting rods	6	9.0	54.0	6.10
Crankshaft	1	*138.50	138.50	15.65
Inlet valves	12	0.50	6.00	0.68
Exhaust valves	12	0.50	6.00	0.68
Inlet and exhaust valve springs	24	0.25	6.00	0.68
Valve collars and locking nuts	24	0.03	0.74	0.08
Valve rockers with bearings	12	1.43	17.22	1.94
Camshaft, with bearings	1	18.75	18.75	2.12
Camshaft tappets	12	0.31	3.75	0.42
Camshaft casing, with air pump and rev. counter drive	1	35.77	35.77	4.04
Vertical shaft driving spindle	1	4.50	4.50	0.51
Ditto, casing	1	2.30	2.30	0.26
Crankcase (top half)	1	97.50	97.50	11.00
Crankcase (bottom half)	1	112.00	112.00	12.67
Propeller hub, complete	1	29.43	29.43	3.33
Carburetters	2	2.00	4.00	0.45
Induction pipes	2	2.00	4.00	0.45
Oil pump	1	5.00	5.00	0.56
Oil leads	1	4.56	4.56	0.51
Magnetos	2	14.37	28.75	3.25
High tension leads and case	2	2.12	4.24	0.48
*Water pump (estimated)	1	8.00	8.00	0.90
*Exhaust manifold (estimated)	1	15.00	15.00	1.70
Miscellaneous parts	1	27.82	27.82	3.15
Total			885.0	100.00



Cross-Sectional End Elevation, 270-h.p. Bassé-Selve Engine.

GENERAL DATA.

Type number	No. 550.
Number and arrangement of cylinders	Six, vertical.
Bore	155.0 mm. (6.10 in.).
Stroke	200.0 mm. (7.87 in.).
Stroke/Bore ratio	1.29 : 1.
Area of one piston	188.7 sq.cm. (29.24 sq.in.).
Total piston area of engine	1132.2 s.cm. (175.44 s.in.).
Stroke volume of one cylinder	3774.0 cu.c. (230.21 cu.in.)
Total stroke volume of engine	22644.0 c.cm (1381.28 c.in.)
Clearance volume of cylinder	1130 cu. cm. (68.96 cu. in.)
Compression ratio (approx.)	*4.34 : 1.
Normal B.H.P. at 1,400 R.P.M.	*269 B.H.P.
Maximum B.H.P. at 1,600 R.P.M.	*302 B.H.P.
Direction of rotation of crankshaft and propeller	R.H.T.
Type of valve gear	Overhead camshaft.
Type of starting gear	Compression release.
Weight of complete engine, dry	*885 lbs.
Weight per normal B.H.P., ditto	*3.29 lbs.
CARBURETTERS	
Number and type of carburetters	Two, 2 jets.
Diameter of choke tube	50.0 mm. (1.96 in.).
Bore of main jets	2.59 mm. (0.0102 in.).
Bore of pilot jets	1.17 mm (0.0046 in.).

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Valve Areas, Gas Velocities, etc.

Diameters :—	
Induction pipe	58.0 mm. (2.28 in.).
Inlet and exhaust effective valve ports (each)	56.0 mm. (2.20 in.).
Cross sectional areas :—	
Induction pipes	H.4 sq. cm. (4.10 sq. in.).
Inlet valve (π dh) and exhaust valve (π dh) (each)	17.6 sq. cm. (2.72 sq. in.).

Mean Gas Velocities (1,400 R.P.M.).

Piston speed	*1837 ft. per min.
Induction pipe	*219 ft. per sec.
Inlet valve	*164 ft. per sec.
Exhaust valve	*164 ft. per sec.

Inlet and Exhaust Valves.

Number per cylinder (each)	Two.
Largest diameter	61.0 mm. (2.40 in.).
Effective valve port diameter	56.0 mm. (2.20 in.).
Angle of seating	45 deg
Lift of valve	10.0. mm. (0.39 in.).
Diameter of stem	11.0 mm. (0.43 in.).
Length of valve guide	90.0 mm. (3.54 in.).
Overall length of valve	146.0 mm. (5.74 in.).
Number of springs per valve	One.
Free length of spring	80.0 mm. (3.14 in.).
Length of spring in position (no lift) inlet	58.0 mm. (2.28 in.).
Length of spring in position (no lift) exhaust	55.0 mm. (2.16 in.).
Mean diameter of coils (top)	36.0 mm. (1.41 in.).
Mean diameter of coils (bottom)	28.0 mm. (1.10 in.).
Diameter of wire	4.0 mm. (0.157 in.).
Ratio, length of spring/lift of valve (inlet)	5.8 : 1.
Ratio, length of spring/lift of valve (exhaust)	5.5 : 1.
Weight of valve complete with spring	0.75 lb.
Weight of spring	0.25 lb.

Inertia Forces, Bearing Loads, etc.

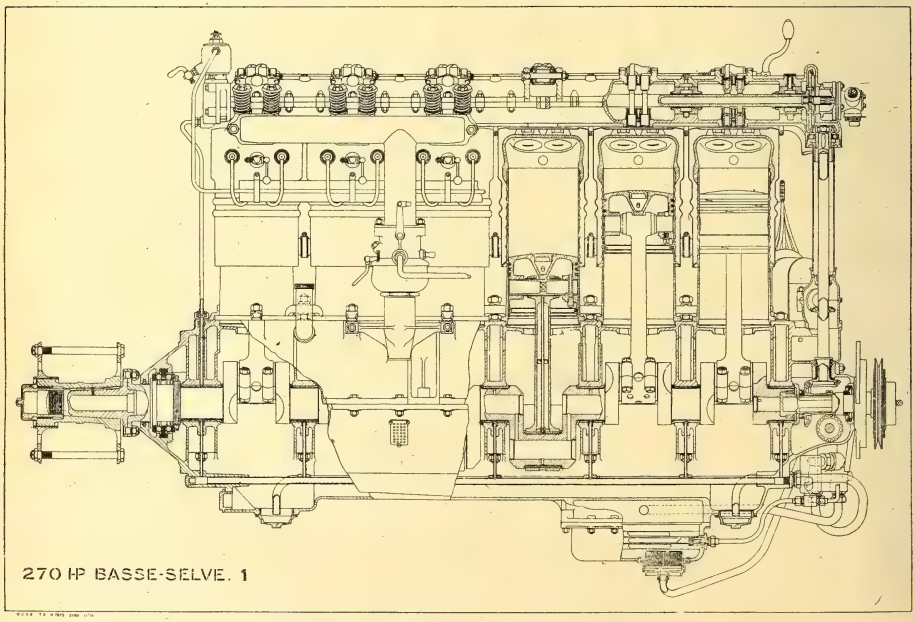
Weight of piston, complete with rings and gudgeon pin	6.187 lbs.
Weight per sq. in. of piston area	0.211 lb.
Weight of connecting rod, complete	9.00 lbs.
Weight of reciprocating part of connecting rod	2.25 lbs.
Total reciprocating weight per cylinder	8.437 lbs.
Weight per sq. in. of piston area	0.288 lb.
Length of connecting rod (centres)	360.0 mm. (14.17 in.).
Ratio, connecting rod/crank throw	3.6 : 1.
Inertia lbs./sq. in piston area :—	
top centre	80.7 lbs sq. in.
bottom centre	45.7 lbs. sq. in.
mean	31.6 lbs sq. in.
Weight of rotating mass of connecting rod	6.75 lbs.
Total centrifugal pressure	1480 lbs.
Centrifugal pressure lbs./sq. in. piston area	50.7 lbs. sq. in.
Mean average fluid pressure, including compression	44 lbs. sq. in.
Mean average loading on crankpin bearing, total from all sources in terms of lbs./sq. in. piston area	115.7 lbs. sq. in.
Diameter of crankpin	70.0 mm. (2.75 in.).
Rubbing velocity	16.8 ft. per sec.
Effective projected area of big-end bearing	53.9 sq. cm. (8.35 sq. in.).
Ratio, piston area/projected area of big-end bearing	3.50 : 1.
Mean average loading on big-end bearing	405 lbs. sq. in.
Load factor on big-end bearing	6800 lbs. ft. sec.

Cylinders.

Depth of spigot at base of cylinder	8.0 mm. (0.31 in.).
Thickness of flange at base of cylinder	10.0 mm. (0.39 in.).
Number of holding-down studs per cylinder	Six.
Diameter of holding-down studs	Four of 16.0 mm.; two of 14.0 mm.
Thickness of water jacket	1.0 mm. (0.039 in.).
Mean thickness of combustion chamber wall	7.0 mm. (0.27 in.).
Mean thickness of cylinder barrel	3.0 mm (0.118 in.).

Piston.

Types of piston	Aluminium (convex crown)
Diameter of top	154.5 mm. (6.08 in.).
Diameter of bottom	154.75 mm. (6.09 in.).
Length	130.0 mm. (5.11 in.).
Ratio, piston length/cylinder bore	0.838 : 1.
Number of rings per piston	Four.
Position of rings	3 above pin, 1 below.
Width of rings	6.0 mm. (0.23 in.).
Type of joint in rings	Stepped.



Part sectional side Elevation, the Bassé-Selve Engine.



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CONNECTING ROD.

Length between centres	360 mm. (14.17 in.).
Ratio, connecting/crank throw	3.6 : 1.
Little-end bearing, type	Phosphor bronze.
Little-end bearing, diameter	35.0 mm. (1.37 in.).
Little-end bearing, length	80.0 mm. (3.14 in.).
Little-end bearing, projected area	28.0 sq. cm. (4.34 sq. in.).
Ratio, piston area/projected area of little-end bearing	6.74 : 1.
Big-end bearing, type	Bronze shell lin'd wh. met.
Big-end bearing, diameter	70.0 mm. (2.75 in.).
Big-end bearing, length (effective)	77.0 mm. (3.03 in.).
Big-end bearing, projected area	53.9 sq. cm. (8.35 sq. in.).
Ratio, piston area/projected area of big-end bearing	3.50 : 1.
Number of big-end bolts	Four.
Full diameter of bolts	12.0 mm. (0.47 in.).
Total cross-sectional area bottom of threads	0.460 sq. in.
Pitch of threads	1.75 mm.
Weight of big-end cap, with two bolts and bearing shell	2.562 lbs.
Total load on bolts at 1,400 R.P.M.	3460 lbs.
Total load on bolts at 1,600 R.P.M.	4530 lbs.
Stress per sq. in. at 1,400 R.P.M.	7500 lbs. sq. in.
Stress per sq. in. at 1,600 R.P.M.	9850 lbs. sq. in.

CRANKSHAFT.

Number and type of main bearings	7, br ze shell lin'd wh.met.
Cylinder centres	210.0 mm. (8.26 in.).
Crankpins :—	
Outside diameter	70.0 mm. (2.75 in.).
Inside diameter	40.0 mm. (1.57 in.).
Length	85.0 mm. (3.34 in.).
Journals :—	
Outside diameter	70.0 mm. (2.75 in.).
Inside diameter	40.0 mm. (1.57 in.).
Length (propeller end)	60.0 mm. (2.36 in.).
Length (rear end)	95.0 mm. (3.74 in.).
Length (intermediate)	63.0. mm. (2.48 in.).
Webs :—	
Width	84.0 mm. (3.30 in.).
Thickness (front one)	37.0 mm. (1.45 in.).
Thickness (others)	31.0 mm. (1.22 in.).
Radius at ends of crankpins and journals	4.0 mm. (0.158 in.).
Weight of complete shaft	138.5 lbs.
Length of complete shaft	820 mm. (38.28 in.).

IGNITION.

Number and type of magnetos	Two, Bosch Z.H. 6.
Firing sequence of engines	Prop. 1, 5, 3, 6, 2, 4.
Number of plugs per cylinder	Two.
Type of plugs	Bosch 3-point.
Ratio, magneto speed/engine speed	1.5 : 1.

LUBRICATION.

Number and type of oil pumps	One, duplex (double actg.)
Bore	45.0 mm. (1.77 in.).
Stroke	12.0 mm. (0.47 in.).

F.G.C., Ap.D. L.

J. G. WEIR, Brigadier-General,
October, 1918. Controller, Technical Department.

R.A.E. METALLURGICAL REPORT.

CHEMICAL ANALYSIS.

The chemical compositions of the crankshaft and piston are as follows :—

Crankshaft.		A 1. Piston.	
Carbon	0.48 per cent.	Silicon	0.45 per cent.
Silicon	0.32 per cent.	Iron	1.06 per cent.
Sulphur	0.061 per cent.	Copper	1.90 per cent.
Phosphorus	0.016 per cent.	Tin	Nil.
Manganese	0.32 per cent.	Zinc	15.62 per cent.
Nickel	2.59 per cent.	Manganese	Nil.
Chromium	1.17 per cent.	Aluminium (by diff.)	80.97 per cent
Vanadium	Nil.		

MECHANICAL TESTS.

Mechanical tests on the crankshaft gave values stated below :—

Mark.	A. Web. Longitudinal.	B. Web. Transverse.	C. Pin.
Diameter	.249 in.	.253 in.	.249 in.
Yield Point, Tons/sq. in.	44.6	44.5	46.3
Ultimate Stress, Tons/sq. in.	55.5	54.4	56.4
Elongation on 4 $\sqrt{A}$	19.5 p.c.	12.8 p.c.	20.8 p.c.
Reduction of Area	48 p.c.	24 p.c.	56 p.c.
Impact, ft. lbs.	28	26	41
	25	25	41

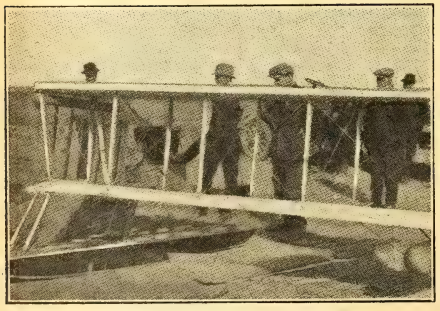
R.A.E., Dec. 5th, 1918.

A True Aerial Target.

The Americans claim another innovation to their credit—namely, a large-scale aeroplane which will fly by itself and can therefore be used as an aerial target.

For a considerable time the Burgess Company has manufactured aeroplanes on the principle evolved by the British aeronautical pioneer, Mr. J. W. Dunne. The Dunne machines were notable for the arrow arrangement of the wings and the absence of a true tail—within the scope of the usual meaning of the term. The machines were, however, eminently stable and could fly indefinitely without assistance from the pilot.

The new target machine produced by the Burgess-Dunne Company is built on this principle, the following being the over-all dimensions :—Span 18 ft. 5 ins., length 9 ft., over-all height 4 ft. 8 ins., and chord of wings 28 ins. The machine weighs 175 lbs., including a 12 h.p. four-cylinder motor-cycle engine, which has been adapted to meet the special requirements. The engine drives a 42 ins. airscrew, which gives the machine a speed of from 40 to 50 miles an hour. It is said that it is capable of carrying the weight of a man.



The Burgess-Dunne Aerial Target.

The apparatus is fitted with a single central float and two wing-tip balancing floats, so that it is started off the water.

Pupils flying ordinary aeroplanes pursue the machine and endeavour to score knock-out hits with machine-guns, a very difficult feat, because the only really vulnerable part of the machine is the diminutive engine and petrol tank. Superficial damage done to planes and structural members is very quickly repaired.

Presumably, also, the machine would form a useful target for practice with anti-aircraft guns from the ground.

Engineers and Demobilisation.

The following letter has been received from the Secretary of the Crystal Palace Old Students Society :—

28, Victoria Street, Westminster, S.W.

Dear Sir,—At the present time a very large number of engineers who formerly held good appointments are looking forward with some anxiety to the time when they will leave the Army, Navy, or Royal Air Force and have to find positions in civil life. Similarly, in view of the great work of reconstruction, employers must know that sooner or later they will be needing competent men, and may have some difficulty in finding them.

I should esteem it a very great favour if you would publish this letter, the object of which is to call together old students of the Crystal Palace Engineering School for co-operation in dealing with the problems of demobilisation as affecting engineers. Over 2,000 engineers have passed through this school, the addresses of many are unknown to me, and they include many men holding the highest positions in the profession. The Council of the Crystal Palace Old Students Society feel that they can do good work in this respect, not only among their own members, but for many others.

May I therefore ask you to insert this letter as an appeal to all old students of the Crystal Palace Engineering School or others interested in the subject to communicate with me by letter.

I would add that this is not an ordinary employment bureau, and that no fees of any kind are to be charged.

I am, yours very truly,

H. C. H. SHENTON (p.p. E.), Hon. Secretary.

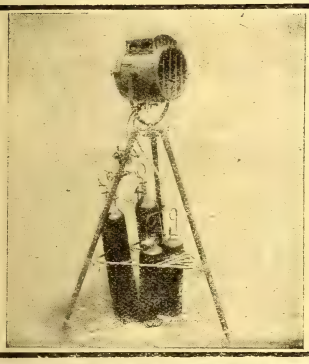
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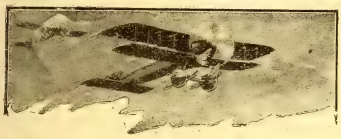
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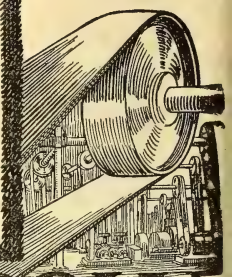
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MARKET TOPICS.

Prices are for Quantities on Usual Terms.

April 10th.

COPPER.—During the past week this market has improved considerably. The general outlook is much better, and it looks as though the clouds of unrest and uncertainty, which have prevailed during the past few months, are gradually disappearing.

It is not advisable to become unduly optimistic, but there are very definite signs of the commencement of an industrial revival, and this is likely to be very marked before the end of the present month. Consequently, values will most certainly harden. So far as Copper is concerned, the market has been very firm, and there should be no barriers in the way of very brisk buying, with the exception of the trade in manufactured Copper, and, as previously pointed out, the prices are not in proportion to those ruling for ingot.

The last report from U.S.A. indicates that business in Copper is fairly brisk, and the immediate prospects of trade revival are very bright.

Comparative Prices.

	Per Ton. £ s. d.
To-day (April 9th)	78 0 0
Last week	81 0 0
Last month	74 5 0
Average last year	115 10 0

TIN.—Towards the middle of last week, the market was very much affected by a report that Tin had been sold in the East at prices which were lower than the prices for which it is understood the F.M.S. Government Copper is held.

Upon receipt of these reports prices declined to £200; buyers became interested and large purchases were made, with the result that values commenced to harden. The report in question, which may have been accurate, apparently only referred to one isolated transaction, but the incident serves to illustrate the nervousness of this market, and the rapid and violent fluctuations do not encourage confidence.

The stocks at present held here are very large, but it is understood that a fair proportion of the metal has been delivered here on account of America.

Comparative Prices.

	Per Ton. £ s. d.
To-day (April 9th)	225 5 0
Last week	220 0 0
Last month	238 15 0
Average last year	239 10 0

LEAD.—There has been recently an improvement in this market, and the activity in business gives cause for optimism, and, on this account, there does not appear to be any reason why there should have been a fall in prices towards the end of last week. The stocks held here are, of course, large, but, on the other hand, the demand from consumers is increasing, while production is decreasing. Further, everything indicates the possibility of a still larger demand for Lead in the near future.

Comparative Prices.

	Per Ton. £ s. d.
To-day (April 9th)	24 10 0 Average.
Last week	25 15 0 do.
Last month	26 15 0 do.
Last year	30 0 0 do.

STEEL.—The position of this market is not very bright at present. In certain sections there are signs of activity and there are indications that it will increase. The shortage of Coal has had a serious effect upon a few mills, but the situation appears to have improved considerably.

It is now practically certain that there will be an advance in price when the subsidies are withdrawn at the end of this month, and as the mills are only accepting orders with price reservations, buyers have apparently come to the conclusion that nothing can be gained by waiting and are entering the market.

There is, of course, the possibility of keen American competition to be considered and this feature of the situation should be watched very carefully. In some quarters it has been said that American prices are not lower than those of British manufacturers, and one instance of the British makers' price for Plates being about £5 less than U.S.A. for delivery to France has been cited. But it is not clear whether the quotation in this instance specified that the price was subject to alteration should it be higher at the date when delivery is effected. This, of course, is a very important point.

American Steel makers are likely to be very keen competitors, as instanced in the Birmingham Corporation Steel Rail Contract, and only last week the Chairman of the Scottish Tube Company stated that they had been compelled to place orders with U.S.A. for Steel suitable for Tubes at a considerably lower price than British makers.

Many firms are anxious to know what the Ministry intends doing with the huge stock of alloy and other Aircraft Steels. It is understood that there are thousands of tons in stock and it is even asserted that there are sufficient stocks of certain classes of Steel for a fifteen years' war.

Are the Ministry holding their stocks back in order to take advantage of a possible higher market after the end of April? If so, the policy may help some department in the effort to justify excess buying, but it is a very shortsighted one as it is in the meantime creating nervousness amongst consumers who are simply living hand to mouth and will not exert all their efforts on their Peace programme.

The market for High Speed Steel and H.S. Scrap is now entirely free from control and the maximum official prices ceased to operate from April 1st, 1919.

It should have been pointed out previously that the subsidies at present being paid by the Government range from 20s. to 60s. per ton and their removal at the end of April is being watched with much interest.

TIMBER.—The market has not been very active during the past week. At the same time there is a certain amount of firmness visible, and there are very definite indications that the worst has now been passed, and this is particularly the case with Mahogany and Walnut. Buyers are showing much more keenness.

The Government have not indicated the action they propose taking with the huge stocks of Aircraft Timber at present held in the country, and until something definite has been done there is hardly likely to be any activity on the part of buyers of Aircraft Timber.

Of course, the demand at present is very small. Prices at present are still showing signs of declining, but there are indications that they may harden now that consumers are becoming interested in the market.

FABRIC.—There is nothing further to report at present. Several members in the House have been manifesting interest in the huge stocks of Fabric which are held. No definite decision apparently has been made by the Government as to the disposal of the stocks, and some statement is being awaited with interest.

Mr. Coatalen's Post-Bellum Policy.

It is announced that Mr. L. Coatalen, chief engineer and joint managing director of the Sunbeam Motor Car Company, Ltd., Wolverhampton, will, in the immediate future, concentrate his attention solely on the design of cars, aeroplane engines, airship engines and gear, and motor-boat engines.

On account of the increase in the size of the works and volume of business, Mr. Coatalen tendered his resignation as joint managing director to the board of directors, who have agreed with his views that it is wise to dissociate the combined duties of joint managing director and chief engineer, it being found practically impossible for one individual adequately to cover both functions in a works so large as that of the Sunbeam Company.

Mr. Coatalen will therefore become chief engineer of the company, devoting the whole of his time to and being responsible for the design of the Sunbeam Company's productions, thus enabling him to give full rein to his proved engineering abilities. He will, of course, retain his seat on the board of directors.

On April 15th, Mr. Coatalen sailed for America to study the conditions of motor manufacture and production in the United States, and it is hoped also that he will captain the team of Sunbeam racing cars entered in the International Indianapolis Race to be held on May 31st.

It is understood that the two Sunbeam cars are the only British representatives, which fact speaks well for the initiative and progressive policy of the Sunbeam Company. The drivers of the cars are respectively Jean Chassagne and Dario Resta.

Mr. W. M. Iliff, who was the joint managing director with Mr. Coatalen, will take up the reins as sole managing director.

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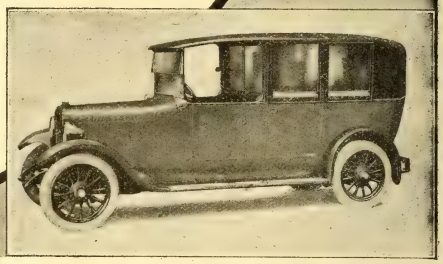


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COMMERCIAL AERONAUTICS & CIVIL AERIAL TRANSPORT

THE ART OF KILLING ENTERPRISE.

By "THE SNIPE."

The distribution of daily newspapers by aeroplane has already been carried out so successfully that the authorities have thought fit to snub officially those superenterprising folk who made the experiment without waiting for Ministerial sanction.

When M. Clémenceau was the guest of H.M. the King it was a pleasing compliment to the distinguished visitor to have his Paris newspapers brought to London by aeroplane each morning for his perusal. That was kingly courtesy, and the success of the enterprise showed the average man on the ground what could be accomplished.

Rapid Distribution of Newspapers.

But now the opportunity has come to give the people the advantages of the rapid distribution of newspapers which were but a short time ago the exclusive privilege of the great.

When the "Daily Mail" arranged to have a special edition of the paper carried by air to Bournemouth, the hope was expressed in these pages that other towns would be favoured in the same manner, but the effort was crushed, "pending the re-opening of civil aviation," to quote Major-General Seely's answer in Parliament.

One can only hope that, when at long last civil aviation is permitted, Britain will not have lost all opportunity of doing pioneer work in commercial aviation. Week by week there are recorded in these pages successful mail-carrying flights made by the French, who are working practically and enthusiastically, unfettered by restrictions.

One can foresee a time when a Postmaster-General will send a Commission to France to inquire into the practicability of this new-fangled method of carrying mails, about which certain aggressively progressive people show so much vulgar curiosity.

In the distribution of newspapers by air Britain has a magnificent opportunity of proving to the world the value of rapid aerial transport, and it is lamentable that journalistic enterprise should be kept in leash indefinitely.

To Those Who Are Not Heartbroken.

One would suggest to those newspaper proprietors whose hearts have not been broken by official obstructiveness that the chief value of the aeroplane to them is to distribute rapidly editions of evening papers.

The existing organisation for the carriage by train of London's morning papers to all parts of the country is so efficient that journals printed in the small hours of the morning reach the public in practically all parts of the Kingdom by breakfast-time. The time saved by carrying these morning papers by air would not be so noticeable to the public as would the rapid distribution of evening papers.

It has for long been an axiom that the circulation of an evening paper must of necessity be confined to a small area compared to that of a morning journal, because the time available for distribution is so much shorter. The greater part of an issue of any London evening paper is at present distributed in London. Towns only a few miles away from the metropolis have their own evening papers, which are able to publish news before the arrival of the London news-sheets.

But the aeroplane makes it possible for the publisher of a London evening newspaper to distribute his journalistic wares over an area included in a circle with, say, a radius of two hundred miles, and this could be done with such celerity that the circulation of the paper could be increased enormously.

For example, by making use of aeroplanes, London evening papers could be on sale in Birmingham one hour after publication, and within half an hour in towns about the same distance away as Brighton.

It would not be necessary to make landings in order to deliver the loads of papers to their destinations. Packed in oilskin bags, they could be dropped at appointed aerodromes, and thus outlying districts with restricted train services could be served.

Difficulties Caused by Mists.

From the technical point of view the afternoon flights would offer fewer difficulties than those in the early morning during the greater part of the year. Mists are very common in the early hours, but are dissipated later in the day.

There is, therefore, nothing to prevent the scheme from being put to a practical test except the too long continued prohibition of civil flying.

From all quarters one hears of vast numbers of machines being scrapped—machines perfectly well adapted for this work. One is told that aeroplanes of the latest designs are lying in the open, rotting, because there is insufficient space in hangars. One hears of R.A.F. pilots being offered machines for about £60 that have cost the public more than twenty times that sum, and nobody seems to ask why reasonable propositions should not be placed before practical business men with a view to realising the asset the country possesses in the surplus aeroplanes that have been idle since the Armistice.

One has good reason to believe that at one Aircraft Storage Depot alone there have been about 500 machines of the most up-to-date type warehoused since the cessation of hostilities five months ago.

And there are many Aircraft Storage Depots!

This country possesses the greatest aerial fleet in the world. This could be adapted to commercial purposes, but, owing to the dilatoriness of officialdom, this fleet is rendered as useless as were those German ships that lay impotently in the Kiel Canal.

Verbal Fondling.

While our manufacturers are coining happy phrases after expensive banquets and telling highly placed officials with breasts of many colours what excellent fellows they are, the Continent is doing the practical pioneer work of applying aeroplanes to commerce.

We have had five months in which to tell each other what wonderful things we did in the production of aeroplanes during the great war, and while we have been verbally fondling each other the process of destruction has been in operation.

We want civil aviation to be made possible, and we want it to be done now.

COMMERCIAL AERONAUTICS.—*(cont.)*

POST-BELLUM POLICIES.

By The Special Commissioner of "The Aeroplane."

THE FAIREY AVIATION CO.

MR. FAIREY.

Mr. Fairey believes in the seaplane. He considers that the seaplane is capable of very rapid development as a commercial proposition. His reasons for this are that the seaplane may be more heavily loaded owing to having larger alighting areas than are generally obtainable for land machines, also in the event of engine failure the seaplane is assured of a landing place.

The Cost of Seaplane Stations.

Furthermore, the expenses in connection with seaplane bases are lower than is the case where an aerodrome has to be kept in order, to say nothing of the increased taxation payable on the land. By the way, although I have never heard of its being done, I suppose that the harbour authorities will not be likely to overlook harbour dues as a source of revenue, especially with the increasing size of the modern flying-boats. I wonder which will be the first enterprising harbour board to do it, and, at the same time, to make definite rules for the regulation of the flying-machine when water-borne.

However, to return to Mr. Fairey, he says that when one gets to really large sizes the boat has the advantage over the land machine in that its landing gear does not go up in weight proportionately to that of the land machine, also that the mechanical difficulties of the chassis of the latter are considerable, as an instance of this he quoted a large German machine where no less than 18 wheels are used to carry the weight of the machine when on the ground. This, as he pointed out, adds considerably not only to weight but to head resistance. He also said that at the moment the size of the large land machine is limited to the weight which can be carried by the pneumatic tyre; it is therefore to be presumed that the very big machines will be boats. He believes in having them very big, too. He showed me what he called his drawing-board. It consists of a "mock-up" of a large flying-boat, all the details being shown even to instruments and engine controls. In this way, Mr. Fairey obtains the maximum of comfort and convenience for the pilot.

The Pilot of the Future.

His ideas on the pilot subject are original and imaginative, and are much fuller than any I have so far obtained.

The pilot of the future he divides into three classes, military small machine pilots, military large machine pilots, and commercial pilots. The first of the military variety, he thinks, will become like the cavalryman and be led into action much as cavalry are; these, he thinks, will rank as privates. The pilot of the large machine, however, he prophecies, will have a staff working under him, and will be much more like a ship's captain, and will be, so to speak, in command of the machine. The commercial pilot, he thinks, will depend for his value on his reliability.

The Small Aeroplane and a Small Demand.

I asked him of the future of the small land machine. Of these, he thinks, that from the manufacturing point of view, it will only be military machines which will be worth competing for, that there is already a sufficiently large number of firms who have specialised in this branch, and that the market for the owner-piloted machines will be small, owing to the boredom of making long cross-country trips. This last argument appealed to me particularly, as I must say one does get bored to death on such journeys, so much so, that it becomes almost necessary to stunt, even if only a little, in order to break the monotony.

That Mr. Fairey will enter for competitions is obvious from his recent entry for the Trans-Atlantic flight, but I gather that he favours the kind where a number of manufacturers are given certain specifications to build to, and where the prize consists of a Government order. He emphasised the necessity for caution in the education of the public, and for care in the financial arrangements of the future.

The Difficulties of Seaplane Construction.

Mr. Fairey is also of the opinion that the seaplane designers have made greater strides during the war than have their competitors in the aeroplane line, and claims a longer life for the seaplane on account of its stouter construction. He also says that seaplane builders have greater difficulties to contend with in construction, such as folding planes and hoisting gear, than have the aeroplane builders, but that, even so, seaplane performance has advanced to a greater extent proportionately than that of land machines.

As a general impression, I think that Mr. Fairey is likely to devote far more attention to seaplanes and flying-boats, and the development of the colossal type in the last-mentioned. He evidently expects the majority of commercial work to be handled by seaplanes, and will, no doubt, lay his plans accordingly.

His views on the labour question are interesting, too, but are not, perhaps, strictly to the point where the future of commercial aviation is concerned.

The Blackburn Co.'s Banquet.

On Monday, April 7th, The Blackburn Aeroplane and Motor Co., Ltd., gave a banquet at the Savoy Hotel to celebrate what was described as the first practical attempt to bring aviation within reach of the public.

There were present, Maj.-Gen. Sir Frederick H. Sykes, K.C.B., C.M.G., Brig.-Gen. H. R. M. Brooke Popham, C.M.G., D.S.O., A.F.C., Mr. Joynson-Hicks, M.P., Mr. E. J. Westerveld (Director-General for Posts and Telegraphs, Netherlands), and Captain A. C. Dunlop (Naval Attaché, Netherlands Legation).

Mr. Stuart Hirst, the Chairman, proposed the toast of "Civil Aviation." In the course of his speech, he said:—

Directly the bar to civilian flying is removed the North Sea Aerial Navigation Company will begin to operate aircraft between Hull, Esbjerg, and Copenhagen, in Denmark, with three branch services—one north of Gothenburg and Christiania; another north-east and east to Stockholm, Helsingfors, and Petrograd; and the third to Amsterdam and Rotterdam. The company were very interested in the design and construction of the vessels, and believed that in a flying boat of about fifty tons, which they had already under consideration, and which would afford accommodation for several tons of mail and merchandise, they had a sound business proposition.

A Boon to Commercial Men.

"What a boon it will be to many commercial men, when they can attend to their correspondence in their own offices in the morning, get over to Bremen, Copenhagen, or even to Amsterdam, transact in an hour business that hitherto would have required a week to put through, and be back safely in their homes in England for dinner the same day." He prophesied that eventually air travel would be the cheapest, safest, simplest, and most convenient, and one of the natural ways of transport. The little Blackburn machine, the exhibition of which was opened by Lady Drogheda in London that day, marked the crystallisation of the first effort in history to present the civilian public with a machine designed for its particular requirements.

General Sykes' Speech.

Major-Gen. Sir Frederick H. Sykes, K.C.B., C.M.G., said that he was convinced that British aviation would win through faster and better than any in the world. A few days ago a machine travelled from Paris to London in an hour and 20 minutes, which was pretty good.

The postal service to Cologne was providing a great deal of information. They were gradually building a system of signals and a regular chain of services, and so far it had been uniformly successful. There had been no passenger casualties.

A North Sea service was as yet in an experimental stage. During the war flying-boats flew backward and forward across the North Sea, but when such a service was established it must be on a uniform, steady basis.

The danger of the large machine was that they did not want any serious set-back in aviation, and if a large machine crashed with a number of people in it it would have a very serious effect.

Referring to the discussions at Paris as to the International Aerial Convention, General Sykes said that two days ago everything was perfectly clear, and it was being put into a proper legal form. He was returning to Paris on Monday, when he hoped the whole thing would be approved. They had already put the home regulations into draft, and as soon as the international regulations were through they could let loose the home regulations. It would be better if they could have them, as far as possible, on an international solid basis.

A Change of Name.

The British Chuck and Piston Ring Company, Ltd., of Holbrook Lane, Coventry, has had the name changed to the British Piston Ring Company, Ltd., and will continue to carry on business at the same address.

An Aid to Speed.

Major-General Seely states that by covering the passenger cockpit in the D.H.4 machines, in order to make travelling more comfortable, the speed of the aeroplane was increased by 10 m.p.h.



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C.D.C.

CIVIL AERIAL TRANSPORT NOTES.

United Kingdom.

Mr. Frank Allen, managing director of Moss Empires, Ltd., has asked a well-known aircraft company to supply him with a machine capable of carrying two passengers and pilot at 100 to 120 miles per hour, for service upon the Moss' Tour throughout the United Kingdom, embracing over 30 variety theatres.

As soon as the official ban upon commercial and private flying is removed an experimental flight will be made.

Australia.

The Commonwealth Government is registering bona fide aerial companies, which, however, will be subject to future legislation and restrictions.

The Australian Aerial Survey party, after surveying large tracts of country, is quite satisfied that there are good landing places in Queensland.

France.

The aeroplane "Goliath" returned from Brussels at 5.45 on the evening of April 7th, accomplishing the flight in two and three-quarter hours. She carried 14 passengers. It is proposed to run a service three times a week between Paris and Brussels.

The Paris-Bordeaux postal aeroplane caught fire on landing on April 7th. The pilot and observer were rather badly burned, and the mails and the aeroplane were destroyed.

Italy.

A mission is expecting to start to Brazil during April to prepare the way for river services with S.I.A.I, Macchi, and other waterplanes. It is composed of four ex-Service men, pilots and organisers. The mapping out of something like 4,000 kilometres of airway is the first task to be accomplished. Also, a governing body has to be organised for the protection of aerial interests when these shall have been propagated. It is obvious that an undeveloped land is that in which aviation can be rendered most lucrative.

The Vickers-Terni firm, of Spezia and elsewhere, who are to build the new fastest Italian biplane, the "Marchetti," announce a dividend for 1918 at the rate of 8 per cent. Their capital is 20,000,000 of lire.

The acquiring of the Fiat-San Giorgio works at Turin by Gio. Ansaldo and Co. during the war permitted the firm to fit their SVA biplanes with the Spa motors, which were built in insufficient numbers by the Spa Company at that time. The manufacture of some 3,000 motors in something less than two years was thus accomplished. The Spa firm was engaged chiefly on very important lorry work for the Army.

I learn that the two lower-power motors built by Isotta and Fraschini, of Milan, are to be supplanted by an engine giving nearer 400 h.p., though nominally of only three-quarters that power. It is generally said that these motors will take some heavy machine across the Atlantic.

In an interview to "Il Secolo" the Hon. Conti, who is winding up the war contracts with aviation firms, says that military personnel and materiel is being used freely now to organise routes for civilian flying. Later these will be handed over to firms able to contract for reliable services.

Serjt. Adolf Massei made a fast flight on a SVA from Otranto to Genoa early in March in very bad weather. In spite of a stop at Rome he covered the distance of 1,300 kilometres in about 5 hrs. 5 mins.

The Palermo authorities announce a "Circuit of Sicily" open to seaplanes. As was well known, Sicily was the home of numbers of Allied Squadrons during the war. The Italian Government is taking over the materiel of these stations, which will be useful for colonial expansion schemes. Talking of trade schemes reminds me that Engineer Forlanini considers that the cost of transport by dirigible will work out as only half that of transport by aeroplane.—T. S. H.

Sweden.

A message from Christianstad states that another German aeroplane, intended for the Swedish Government, has been wrecked in South Sweden when starting for a flight. The machine had not yet been delivered to the Swedish Government, so, consequently, the loss is borne by the German owners.

Holland.

The delegation from the Dutch Government which arrived in this country last week to prepare the way, in consultation with British Ministers, for commercial flying between Great Britain and Holland, returned to their own country in a flying-boat from Folkestone on Friday, April 11th. The visit has been highly successful, and many different views of the general question of commercial flying have been discussed, of which not the least interesting is concerned with the formation of plans for providing a port of call in the Dutch East Indies for British aeroplanes flying to Australia.

The members of the delegation are Mr. H. Colyn, ex-Minister of War and member of the Senate; Mr. E. P. Westerveld, Postmaster-General; and Mr. J. J. Stieltjes, ex-Postmaster-General of the Dutch East Indies. Nine days have been spent in consultations with the British Air Ministry and the British Postmaster-General, and in visiting some of the aeroplane works, including those of Mr. Handley Page at Cricklewood and of the Grahame-White Company at Hendon.

The conclusions which have been drawn from these conferences will be laid before the Dutch Government in due course, and the inauguration of a definite North Sea service will have been brought so much nearer.

Portugal.

An aeroplane service will fly this summer between Barcelona and Lisbon via Madrid, Oporto, and Coimbra.

Switzerland.

According to the Italian papers, most of which have efficient Swiss correspondents, the German Elektrizitäts Gesellschaft are dumping metal Aviatik aeroplanes for postal service work in large numbers in that country, to the natural disgust of the firms that hope for Swiss Government contracts for such craft.—T. S. H.

United States of America.

Specifications for postal aeroplanes have been issued to tender by the United States Post Office.

It is stated in Detroit that the first aeroplane salesman arrived there from Syracuse, New York, in a small aeroplane. He sold a large quantity of goods by sample and announced that he would visit other cities by air this week.

The Late O. P. Monckton.

Those who have been much concerned with aero-engines will hear with very deep regret of the death on April 9th of Oliver Paul Monckton, M.A., M.I.C.E., the London representative of the Dudbridge Ironworks Co. During those queer tests for the Naval and Military Engine Competition of 1914, which were brought to an abrupt end by the outbreak of war, Paul Monckton was constantly at Farnborough looking after the Salmson engines which had been entered by the Dudbridge Co., and all who met him recognised his outstanding ability as an engineer.

He was a scientist of considerable attainments besides being a practical engineer with much experience in Africa and India. His work in India seems to have laid the seeds of illness which so weakened his constitution that he was unable to stand the strain of extra labour entailed by the war. The result was that in 1917 he suffered a nervous breakdown from which he never recovered. He was buried at Boscombe on April 12th.

Paul Monckton was a man of somewhat shy and retiring nature, but to those who were privileged to be numbered among his friends he was one of the most charming people imaginable. He was extraordinarily well read, and besides having a very keen and delicate sense of humour, he was in his quiet and unobtrusive way a constructive humorist of a very high order, with a tendency to mathematical jokes rather in the manner of the late "Lewis Carroll." One looks back to many pleasant hours spent in his company, and while one regrets that one has lost a good friend one regrets still more that the country has lost a man who, if he had lived, would have done valuable service to the State.—C. G. G.

An All-Metal Biplane.

In the adaptation of the aeroplane to commercial requirements the wearing capacity of all its parts becomes of prime importance. It is in some of the lesser developed lands where communications are still poor that one may look for a rapid adoption of aerial transport; and it is in such countries which are subject to tropical heat or northern cold the climate may have a detrimental effect on the aeroplane constructed principally of wood.

It is to cope with this difficulty that the British and Colonial Aeroplane Co., Ltd., of Filton, Bristol, have evolved a biplane of all-metal construction. The fuselage itself is a special construction of aluminium and steel, and is in sections which can readily be dismantled for transport.

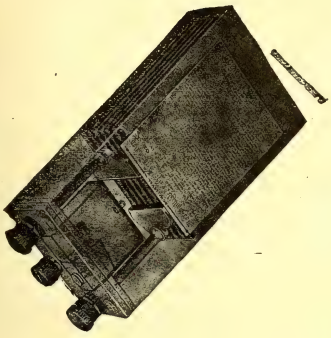
The struts are of high tensile steel throughout, and the wings are made of aluminium and high tensile steel. The performances of this machine, which is fitted with a comparatively low-powered engine (180-h.p. Hispano-Suiza), have proved that the all-metal construction does not adversely affect its speed or rate of climb, whilst its weight (1,700 lbs. with engine) compares very favourably with that of a wood-built machine.

When loaded it can carry 450 lbs. of cargo. At ground level it has a speed of 110 miles per hour, can climb 5,000 feet in 8 minutes, and has a landing speed of 47 miles per hour.

A Change of Address.

The Head Offices of the Thames Aviation Works, Ltd., are being transferred from London Fields Railway Station, Great Eastern Railway, which is now required again for passenger traffic, to the new and fully equipped factory at 30a, Highgate Road, London, N.W. 5.

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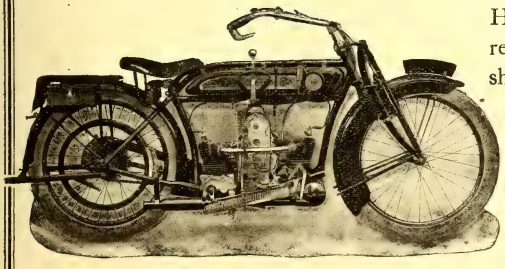
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AIRCRAFT FINANCE

DEPRECIATION ALLOWANCES FOR TRANSPORT VENTURES.

It is one of the common faults of most of the calculations of the working costs of hypothetical aerial transport schemes that the vital question of depreciation charges is either completely ignored or referred to cursorily.

Yet it is no exaggeration to claim that the provision of adequate depreciation is one of the determining factors in relation to the successful financial consummation of such commercial ventures. It must be considered rather seriously in connection with some of the budding projects, the sponsors of which are better endowed with optimism than logic.

Wait and Watch

Certainly the prospectuses of aeronautic transportation companies when they appeal for the consideration and the favour of the investor must provide some illuminating data on the subject of prospective profit-earning capacity *after adequate provision for depreciation.*

The Parallel of Shipping.

If one takes the parallel of the shipping venture, there is interesting evidence to be obtained, but evidence that is scarcely applicable to a totally distinct and unproved enterprise.

Some of the conservatively managed shipping companies may write down the value of the fleet by 10 per cent. annually; some may provide a larger percentage, and others less, after reasonable and actuarially adequate provision for upkeep, renewals, and the like.

Assumed Life.

The assumed life of the asset is, say, ten years, and by that time there will be a sufficient sum provided, before striking the annual profits, to effect the replacement of the constantly wasting assets by something more modern and capable of earning adequate income.

Wear, Tear, and All Costs.

The question is: Would 10 per cent. provision for depreciation suffice to cover adequately the ordinary wastage suffered by aeroplanes on a regularly established service for mail passengers and goods? Perhaps it is a pity that the parallel of the steamship is taken, because the two are dissimilar. Yet it is useless to take the case of a railway, because there is even less similarity.

Even in the case of a railway it would be stupid to elaborate any calculation of net working costs without adequate allowances for wear and tear of rolling stock and permanent way, upkeep of stations, etc., etc., and the other multifarious items comprehended by the expressive commercial term—depreciation.

Capital Outlay, Etc., and Earnings.

Admittedly the original capital outlay involved in the purchase of an aeroplane is comparatively small. But so is the income of a single aeroplane comparatively small. The consideration of the initial capital outlay does not bring one nearer to a solution of the problem.

In comparison with the railway, the aeroplane is as tender as a new-born babe; and a steamship, although experiencing more than an ordinary amount of bad weather and consequent buffeting, requires a lot of knocks before it is put out of action completely. The aeroplane may not be, as it has been erroneously described, essentially a fine-weather craft, nor is it simply a millionaire's toy.

How Long Will They Last?

It will be conceded, however, that the commercial aeroplane, scientifically and soundly built though it may be, will entail a larger allowance for wear and tear and depreciation than most people imagine. A machine that is capable of earning as the result of a year's work on any ordinary commercial service sufficient income to cover its original cost, the expenses of upkeep, renewals, insurances, etc., etc., etc., bear its due proportion of station, etc., etc., outlay, wages, etc., etc., and a reasonable dividend, would not need to be written down by a 100-per-cent. allowance for depreciation. That is obvious.

Replacements.

But if the machine had to be scrapped as no longer serviceable before it attained the goal just outlined, there would be no alternative but to replace it by a new machine, the cost of which would be charged to capital account. The difference between the net loss on the original machine and the cost of the new one constructed and commissioned to replace it would result in so much addition to capital.

Unsound Business Practices.

Obviously it would be unsound and menacingly dangerous to carry on a business proposition on such lines. The time would come when a company conducted on such loose principles would be interviewed by a receiver.—W. J. Davies.

CURRENT TOPICS.

More Capital for Handley Page.

Of considerable interest is the new capital being raised by Handley Page, Ltd. It is the first public issue made by the well-known concern, the capital of which is £650,000, and profits of which for the year to Dec. 31st last are stated to be £224,750. The new issue consists of 500,000 7 per cent. cumulative and participating preference shares of £1 each.

Last December the authorised capital was increased to £500,000 by the creation of £350,000 preference and £140,000 ordinary shares; it has since been increased to £650,000.

It is said that these new shares will participate up to a maximum dividend of 14 per cent. The proportion of preference shares with participation rights to the total capitalisation is not so pronounced as in some aeronautical concerns, but it is, nevertheless, quite considerable.

The Triplex Safety Glass Scheme.

There has been some fluttering in the shares of the Triplex Safety Glass Co., based on the knowledge that shareholders are to be offered a new share in respect of every one held at a premium of 15s. At the advanced price of about 43s. for the old shares this would represent quite a profitable turn, but it would be as well to take into consideration the possible effect on dividends of the larger capital.

An Amalgamation.

It is now announced that the contemplated fusion of Dennis Bros. and White and Poppe who have been intimately concerned in the aero-engine business, will be carried through by an exchange of shares.

At the same time some of Dennis Bros. reserve will be capitalised and a bonus thus provided for shareholders.

State's Aircraft Insurance Profits.

A lot of criticism has been directed against the Government's Aircraft and Bombardment Insurance scheme or rather the policy directing it. The return of part of the premium has been advocated in some quarters, but seeing that a bargain is a bargain and that the Government has been over-generous with its expenditures in many directions the claims for rebate ought not to be entertained.

AIRCRAFT IN PARLIAMENT

The following oral answer was given on April 8th :—

AERODROME EXTENSION—(YORKSHIRE).

Major LANE-FOX asked the Secretary of State for War what is the cause of the undue delay in paying the rent admitted by the War Office to be due to the Rev. S. Howard Hall for land at Sherburn-in-Elmet, in Yorkshire, taken over for the extension of the aerodrome early in 1918, and whether he can hurry the payment of this debt, which has been repeatedly applied for?

Mr. FORSTER : I understand that occupation was taken in this case under the Defence of the Realm Act, and therefore rent is not payable, but compensation is awarded in such cases by the Defence of the Realm Losses Commission. As regards the question of delay, I am informed that a claim in proper form was first submitted on Nov. 16th, 1918, and that an amended claim was submitted on March 14th, by the solicitors acting for Mrs. Hall, who is the owner of the land. In forwarding this amended claim the solicitors did not complain of delay on the part of the War Department, but, on the contrary, regretted slight delay in consequence of their client's illness. There is, I gather, every prospect of the claim being settled now very expeditiously.

* * *

The following written answer was given on April 9th :—

ROYAL AIR FORCE.—CASUALTIES DEPARTMENT (LIEUTENANT STEPHENS).

Sir PETER GRIGGS asked the Under Secretary of State to the Air Ministry if he is aware that no definite reply has been given by the officer in charge of the Casualties Department, Royal Air Force, to Mr. E. H. R. Stephens, of 21, Clarendon Gardens, Ilford, respecting the proved death and burial of his son, Second Lieutenant D. F. Stephens, to enable him to settle his affairs, and also not to be in the position of having to continue payment of his life insurance premium, etc., and will he make inquiries into the matter?

Major-Gen. SEELY : In cases where there is no certain evidence of the death of an officer, but where the facts would appear to establish a presumption of death, the regular practice based on legal advice is to forward to the next-of-kin a letter stating that death has been presumed. Such a letter was sent to Mr. Stephens at the address mentioned in the question on February 26th last. I am having the case investigated with a view to ascertaining whether anything further can be done.

* * *

The following written answer was given on April 9th :—

ROYAL AIR FORCE.—OVERSEAS RECRUITS (PASSAGE MONEY).

Lieut.-Col. Sir JOHN HOPE asked the Under Secretary of State to the Air Ministry whether the actual amount paid in passage money by British subjects who came from America to enlist in the Army or Air Force may be refunded; and, if not, what is the limit of the amount which may be refunded?

Major-Gen. SEELY : So far as the Royal Air Force is concerned, the refund which is made is not necessarily the amount actually paid by the individual. The refund is limited to the amount at which a passage of the appropriate class by the most economical route could have been obtained. This amount is £21 for first class and £7 10s. for third class passages from United States or Canadian ports to England.

WIRELESS OPERATOR (N. G. HOLMAN).

Mr. R. McNEILL asked the Under Secretary of State to the Air Ministry if he is aware that N. G. Holman, No. L.Z. 5,793, Royal Air Force, who was formerly a wireless operator in the Royal Naval Volunteer Reserve, received a notice on April 2nd, 1918, that he had been transferred to the Royal Air Force; that on August 20th, 1918, he was sent to England and was in hospital at Llandudno till December 10th, 1918, on which date he received hospital leave for home, where he has been till the present time; that during the whole of this period he has received no pay with the exception of two sums of £5 sent him by the Royal Air Force pay office at Woking, in response to appeals on Holman's behalf by a Staff Captain; that on March 20th, 1919, he received a letter under Reference C.D./M H S./28?/5 from the Royal Air Force authorities at Blandford, saying that as Holman had never been transferred and had only been attached to the Royal Air Force, they had no responsibility for him; if he will inform Holman who was, or was not, transferred to the Royal Air Force; and, if so, whether he will now receive all arrears of pay due up to the present date?

Major-Gen. SEELY : I am having inquiries made, and will inform the hon. Member of the result.

NORTH RUSSIA FORCE (EQUIPMENT).

Mr. RAPER asked the Under Secretary of State to the Air Ministry if the Air Force people originally attached to the Northern Russian forces were at first equipped only with seaplanes, and if the pilots in question had to fly seaplanes 40 or 50 miles inland over wooded and hilly terrain; and, when the danger of using seaplanes was apparently realised, were our Air Force people in that district equipped with D.H.6's, which machines have a maximum speed of about 50 miles an hour and are unable to make any headway against anything in the nature of a high wind?

Major-Gen. SEELY : In situations where it is impossible, owing to the nature of the ground, to erect aerodromes, it is found most convenient to employ seaplanes instead of aeroplanes, provided that water is not too far away. Seaplanes alone were at first employed with the North Russia force for this reason, and will continue to be used. No D.H.6 machines have been sent to North Russia for war purposes, though in certain districts it has been found possible to employ aeroplanes of other types.

TECHNICAL OFFICERS (PAY).

Sir F. HALL asked the Under Secretary of State to the Air Ministry whether technical officers are split up into two grades, namely, Category A and Category B; whether the former receive technical pay and whether the latter do not do so; whether the duties of those in Category A include compass officers and inspectors of fire services; whether those in Category B include those qualified in armament, chemistry, metallurgy, and photography; if so, whether the duties of those in Category B entitle the officers therein to the same technical pay as those whose duties are to inspect fire services; and whether he will take steps so that both groups of officers are granted the same technical pay.

Major-Gen. SEELY : The answers to the first four parts of the question are in the affirmative; the answer to the fifth part is in the negative. As regards the last part, the whole question of the future emoluments of officers of the Royal Air Force is now under consideration, and an announcement will be made as soon as a decision is reached.

BRITISH CELLULOSE AND CHEMICAL MANUFACTURING COMPANY.

Lieut.-Col. MALONE asked the Chancellor of the Exchequer whether he was aware that the British Cellulose and Chemical Manufacturing Company are about to increase their capital by approximately £1,250,000 in preference shares; and whether this matter has received a licence under the revised Regulation 30 F of the Defence of the Realm Regulations.

Mr. CHAMBERLAIN : The answer to the first part of the question is in the affirmative. The application of the company for permission to issue fresh capital was granted in January last, prior to the introduction of the Defence of the Realm Regulations referred to.

MUNITIONS.—AIRCRAFT FACTORIES.

Mr. LUNN asked the Parliamentary Secretary to the Ministry of Munitions if he was aware that numbers of men have been discharged from certain aircraft factories within the London area since November 11th last; that discharges are still being made despite the fact that within these factories there are stocks of raw material suitable for being used in the manufacture of doors, cupboards, stairs, wardrobes, and other necessaries in the construction of houses, and the internal fittings of the same, and that the machinery capable of making these useful articles is now standing idle; and whether he will consider the advisability of using this material, machinery, and labour for this purpose within these factories or of its disposal for immediate use elsewhere.

Mr. HOPE : There is only one National aircraft factory in the London area to which the conditions indicated in the question would, in any way, apply, and that factory is engaged on the salvage of aircraft rendered obsolete by the termination of the War. I understand that there is sufficient capacity in the country for the manufacture of doors, cupboards, and other house fittings. Materials and machinery suitable for the purpose and surplus to the requirements of the Government are being placed on the market by the Disposals Board.

Mr. LUNN : Is the hon. gentleman aware that at the Grahame-White factory in Edinburgh there are several thousand cubic feet of wood, all of which is suitable for house-building purposes, and, having regard to the Government's programme, is it not desirable that that wood should be used for building purposes instead of men being dismissed and coming on to the unemployment fund as they are doing?

Mr. HOPE : The instance I had in mind was not the one at Edinburgh. I have no knowledge of the wood being stored there.

Mr. LUNN : Will the hon. gentleman make inquiries?

Mr. HOPE : Certainly.

AIR POSTAL SERVICE—EXPERIMENTAL.

Mr. GILBERT asked the Postmaster-General if he has made arrangements for the provision of an aerial post in this country, or between Great Britain and Ireland, or from London to the Continent; if any experiments or trials have been made with the object of setting up such a postal service, and if he can make any statement on the subject.

Mr. ILLINGWORTH : An experimental service has been established between Folkestone and Cologne for the conveyance of Army mails. No other Air mail service has been established in this country, or with Ireland or the Continent.

Sir H. DALZIEL : Does the right hon. gentleman contemplate an early flying service to Scotland?

Mr. ILLINGWORTH : As soon as airmen can find London in a fog and land in a fog it will be practicable, but at present it is quite impossible, because the efficiency is only about 60 per cent.

CIVIL AVIATION.

The Secretary of the Air Ministry makes the following announcement :—

In order to assist civil aviation and to enable firms interested in aviation more easily to carry out their programmes, it has been decided to release a certain amount of material, particularly engines, and aeroplanes originally ear-marked for the use of the R.A.F.

Civilian firms, therefore, desirous of obtaining aeroplanes, engines or other material, should, in future, apply in the first place direct to the firm concerned in the manufacture of the material required. Should the firm approached be unable to meet the request owing to existing contracts for delivery to the R.A.F. a request for the release of such material will be considered by the Air Ministry. All such requests should be addressed to "Secretary, Air Ministry (C.G.C.A.)," and should state specifically that the firm responsible for the manufacture of the material required has already been approached, but owing to existing contracts, has been unable to supply.

The Air Ministry made the following announcement on April 15th :—

It is intended that civil aviation shall commence, under regulations shortly to be issued, on May 1st. Applications have been received from various companies for permission to carry civilian passengers for short flights during the Easter holidays in anticipation of the issue of the regulations. It has been decided to give permission for this between the dates of April 17th and 22nd inclusive. The flights must be made from an approved aerodrome, subject to an undertaking being given that the rules of the aerodrome will be strictly observed, and will be limited to a radius of three miles from the aerodrome. Service-type machines, which have been built under the supervision of the Aircraft Inspection Department, will alone be used.

Applications for permission to carry out such flights should be submitted, addressed to the Secretary, Air Ministry, marked Controller-General of Civil Aviation, and should contain the following particulars :—

(a) Type of machine, with sufficient particulars to identify it.
(b) Full name and surname of the pilot.
(c) Location of the aerodrome and of the aircraft proposed to be used.
(d) Name of the company or firm making the application.

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AERONAUTICS and The LAW

THE KING'S SKY-WAY.

By "THE LINCOLN IMP."

"The wayfaring men, the fools, shall not err therein."

Coming Legislation.

Whatever may be the law as it stands with regard to the right to fly over other men's land—as to which see the article "Goshawks"—there is common agreement that some right of passage must be conceded in the future and, if necessary, by the legislature. The statement usually made is that a public right of way will be given for aircraft of all descriptions. Will this meet the case?

A Highway Defined.

Public ways or "highways" include all thoroughfares or ways (including culs de sac) which are open to the common use of the King and all his subjects. It may be the King who is the wayfarer or his subjects, or their cattle, or their horses, or their sows, or their hens, or their carts, or their traction engines, or their motor-cars, or their bath chairs, or their scooters, or their ferry-boats, or their steamers, or their sailing vessels, or their rowing-boats, or their other vehicles, or any liege wayfarers whatever.

So, too, the way may lie over land or over water. The right of navigation has been said to be simply a right of way.

No beaten track is essential to a highway, and un haut chemin has been said also to lead from the sea throughout all England, so that no terminus a quo nor terminus ad quem is necessary (Halsey's Case, Latch 183, and R. v. Hammond, 10 Mod. 382). And the sea has been called "the necessary highway of all nations."

The Sky Highway.

There is, then, no incongruity in including in the term "highway" the public right of passage by air over the soil and territorial waters of the realm exercisable by aircraft of all descriptions. For convenience of distinction let us here call it "a sky-way."

May a kite-balloon be moored or an airship or helicopter hover above a private estate? Does the right to use an aerial route confer the right to take photographs from the craft? In fine, what limits, if any, are there on the lawful use of a sky highway?

"Pass Along, Please."

In a case of Goodtitle v. Alker and Elmes (1 Burr. 133), decided in 1757, it was said that the owner of the soil of a highway has a right to all above and under ground except only the right of passage for the king and his people; the decision is founded on old cases in the Year Books (8 Edw. IV. 6, and 2 Edw. IV. 9) which lay down that "En un hault Chimin le Roy nad auter soufque le passage pur luy & les people, mes le frantenement & touts les profits come arbers, &c., appertient al seigneur del soile."

In 1795 some cows wandered from a highway through a gap in the hedge, and being "distrained damage feasant" gave rise to legal proceedings reported as Dovaston v. Payne (2 H. Bl. 527). The cows were described in the pleadings as "being in the said highway" instead of "passing along and through the said highway." Three judges agreed in deciding that the cows must be taken to have been trespassing; since cows have no business on a highway unless they are passing along it.

The principle of Dovastor v. Payne is still law, and, by analogy to it, hovering aircraft would seem to be trespassing; unless, indeed, the craft is only hovering for the purpose of loading or unloading or some other reasonable purpose and in a reasonable manner (see Original Hartlepool Colliery Company v. Gibb (1877), 5 C. D. 713), where Sir George Jessel laid down the conditions under which craft may reasonably moor in a public highway such as a navigable river.

That there is no general right to "loiter" on a highway is familiarly brought home to us by the "Pass along there, please," of the policeman. Indeed, it is the foundation of the police method of controlling crowds in the streets by the process of "moving them on."

Modern Views.

The primâ facie right of the public, therefore, is merely to pass and repass along the highway; but as recently interpreted by the Court of Appeal it is "subject to all those reasonable extensions which may from time to time be recognised as necessary to its exercise in accordance with the enlarged notions of people in a country becoming more populous and highly civilised; but such extensions must be such as are not inconsistent with the maintenance of the paramount idea that the right of the public is that of passage."

One of the Lords Justices in this case (Hickman v. Maisey [1900], 1 Q.B. 752 C.A.) said that if a man took a sketch from the highway no reasonable person would treat that as a trespass. Which dictum may be held to cover a photograph from the air. But photographs taken and published on commercial lines will be difficult to distinguish from the commercially valuable notes which were held to make Maisey a trespasser.

The Racing Tout and the Spoil Sport.

The defendant Maisey was a racing tout. He hit on the brilliant and paying idea of watching with the aid of glasses from a highway across the Wiltshire downs the trials of racehorses which used to take place on the plaintiff's adjacent land. His "tips" must have been prime! He claimed the right to do what he did as a member of the public using the public highway.

Nevertheless, he was held a trespasser by all three of the Lords Justices on the ground that noting the horses' "form" in this fashion was not a reasonable or usual mode of using the highway as a highway. In so deciding they followed another decision of the Court of Appeal reported as Harrison v. Duke of Rutland [1893], 1 Q.B. 142 C. A.

Harrison, for some reason, objected to the Duke shooting grouse on the Duke's own moor; so he planted himself on a public highway crossing the moor and by waving his pocket-handkerchief and opening and shutting his umbrella, and by other obvious means, he kept the grouse from flying towards the butts where the Duke and his friends were waiting to shoot them.

This annoyed the shooting party, who caused Harrison to be held down on the highway till the shoot was concluded, which in turn annoyed Harrison, who brought his action for assault, in which he failed on the ground that he himself was trespassing on the highway because of what he did there.

The Sportsman.

In the criminal case of Reg. v. Pratt [1855] (4 E. & B. 860), P., a poacher, was on a public highway in the daytime carrying a gun and accompanied by a dog. B. was the owner of a cover on one side of the road and of the soil of the road itself. P. waived (*sic*) his hand to doggie, doggie entered cover, out flew a pheasant over the road. P. fired at the pheasant and missed it. He was not ostensibly convicted for missing the pheasant, but for trespassing on the highway in search of game.

The Butterfly Catchers.

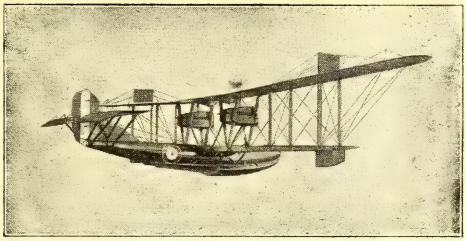
An injunction to restrain butterfly catching on a highway was refused in a case of Fielden v. Cox (22 T.L.R. 411), the facts of which are worth giving rather fully, partly because one of the defendants was a Mr. Rupert Brooke and partly for the unusual humour of the reporter.

In June or July of 1905, Mr. Cox, a medical student and B.A. of Cambridge, aged 22, and three brothers named Brooke, all younger than Cox, were visiting in the neighbourhood of the plaintiff's estate, on which game was preserved alongside a public highway. One of the brothers—apparently Rupert—was only down one day, returning home the following day. As his counsel, Mr. Buckmaster, observed "he went to catch a butterfly and caught a writ."

During their visit the defendants occupied a considerable time in catching moths and other insects; and the principal complaint against them was that they had visited the road and trespassed thereon for the purpose of carrying on their pursuit of attracting and collecting moths or other insects. This "gang of desperate men," as one of their own counsel described them, had, when tackled by a solicitor's clerk in pursuit of their solicitors' names, etc., obtained from the clerk a definition of an injunction and told him that they had no solicitor and would accept personal service.

They had also performed a dance to relieve their feelings, but had ultimately accepted a suggestion from the clerk that they should leave the neighbourhood and give their word of honour not to repeat their acts.

It was not alleged that the defendants, all of whom gave evidence, behaved otherwise than in a civil and gentlemanly manner. One shilling had been tendered before action and was brought into court to satisfy the plaintiff's claim for damages in respect of their trespasses. Buckley, J., refused an injunction, described the action as "oppressive to the last degree," gave the plaintiff the shilling out of court, and made him pay the costs of the defendants.



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This selection of cases is sufficient to show that the grant of a right of way over private property for the passage of aircraft will fall very far short, both in practice and in theory, of achieving the same results as would follow from a decision of the Courts or a declaration of the legislature which negatived the doctrine that the ownership of land extends into the blue infinity of space.

The Usque ad Cœlum Doctrine.

If the usque ad coelum doctrine is correct, you are inside my park palings when you fly over my land; true it is that you may be there as of right and because you are a liege subject travelling along a public highway; but you must not linger or loiter or circle overhead watching horse races or football matches or shooting at pheasants or wild birds, or firing into the sea, or practising stunts or taking aerial photographs; nor may you disturb me in the exercise of any of my lawful rights as the landowner; nor may you do anything else, however reasonable or otherwise legal, which is not reasonably incidental to your right to pass.

If the usque ad coelum proposition is too succinctly stated to be an exhaustive exposition of the law on the subject, the position of an aviator may be very different. The skyfarer may be as free in the use of the air as the seafarer is free in the use of the seas.

On principle, on the high seas the rights of navigation and fishing are free to all the world without any restriction or limitation whatever, and one has never heard it suggested that a photograph of the bed of the ocean could infringe anybody's rights of property. But then the bed of the ocean is vested in nobody?

In the racing tout case Lord Justice Romer said: "No doubt if what the defendant did had been done by him on soil which was not vested in the plaintiff, the latter would have had no legal right to complain."

It may very well be found that the supposed right of an individual owner to protect his plot from aerial trespass will prove a jus sine remedio because of the practical impossibility of pinpointing the aircraft in the air at the moment of its alleged trespass. The proposed right of aviation may be conceded as a right of navigation or as a right of way.

In Orr-Ewing v. Colquhoun [1877] (H. L. (Sc.) 2 App. Cas. 839) Lord Hatherley treated these two rights as one and the same. "There are two totally distinct and different things," he said; "the one is the right of property and the other is the right of navigation. The right of navigation is simply a right of way."

But the right of navigation is really more extensive than the other, for it includes rights of fishing and of incidental use of shores and river banks, and sometimes the right of roaming in indefinite directions which cannot be included in a land right of way.

Right of Alighting on the Sea.

If a right of navigation is given to the aviator, it may include a right to land from the air as one may land on the shore from the sea. And that without toll or compensation so long as the right is exercised reasonably. Nor is this as wild a suggestion as it may seem, at least with certain extensive reservations; there are the cases of flying-boats and such craft which may need to land in shallow water and taxi to the shore; there are free balloons which cannot foresee with exactness their landing places; there are waste places on which the landing of aircraft will do no harm; and there is the stress of circumstances to be considered.

In considering the dawning problems involved in the law of aviation, over and over again one is faced with the fact that their solution is the resultant of two forces—the existing law of the land and the existing law of the sea. It is almost as though the sea had flowed over the land, leaving the landsmen alive and squirming on its bed and the seafarers sailing over their heads.

The Humours of R.A.F. Methods.

In a club corner a number of R.A.F. officers were laughing over the story of a bradawl that was being told by one of the party who had been an E.O. in the early days of the R.F.C.

"The most marvellous thing in life to me," he said, "is an ironmonger's shop. You may find in charge a man and a boy who run the business. They order the stock, know where every one of the ten thousand or so items is kept, serve customers, and keep the accounts. If you require, for example, a bradawl, one of them will get what you want in about 30 seconds, and, in a couple of minutes, the transaction will be complete.

"Now, if that shop were dumped down in a muddy patch on Salisbury Plain and called a Technical Store, it would require an O i/c Stores, Assistant O i/c Stores, a Serjeant, a Corporal or two, and a dozen Airmen.

"And to every Airman a W.R.A.F. or two.

"The transaction of supplying a bradawl to an Airman in one of the rigging sheds would give occupation to most of the members of the staff. In the first place the R.A.F. does not recognise such a word as 'Bradawl.' It is a combination of 'Awl, brad, blade, one,' and and 'awl, brad, handle, one.' It must be demanded from the depot by this nomenclature. The Airman must make out requisitions for it in the same fashion, and the requisitions must be signed by his Officer.

"In my early days, when my chief idea was to get along with the war, I was severely strafed by a Staff Captain from the Air Ministry for keeping bradawls assembled ready for issue. He explained that 'awls, brad, blades' and 'awls, brad, handles, were entirely different kinds of stores. One was 'A' (i.e., unexpendable), the other 'B' (expendable). He was not sure which was which, but he explained that a special Department had been formed at the Air Ministry to decide these points.

"He put through a Priority Call to the Department and asked for a ruling. I believe a conference was called, and the finding of the Court was that an 'awl, brad, blade," was an 'A' store, and an 'awl, brad, handle,' was 'B' (expendable).

"How the conference arrived at this brainy decision, I do not know. I presume they argued that the 'awl, brad, blade' being of metal, ought to last longer than the 'awl, brad, handle,' which was of wood. Arguing on the same line, they would have said that a nib should last longer than a penholder.

"However, the ruling was given, and the Staff Captain explained that if an Airman required a bradawl he must make out one requisition form for an 'awl, brad, blade,' and another for 'awl, brad, handle.' Both forms must be signed by an Officer, and entries must be 'posted' on different Tally Cards and in Ledgers kept to record the receipts and issues of 'expendable' and 'unexpendable' stores.

"If it was found necessary to assemble the bradawls the work of recording and accounting for this engineering feat would offer great fun to the staff. They would take a specially designed voucher and write in triplicate 'awls, brad, blades,' and 'awls, brad, handles' on one side, and 'awls, brad complete' on the other. They would then give a number to the voucher and use the number as a reference to write off the items from the Tally Cards and Ledgers for A and B stores, and open up a fresh Tally Card and Ledger sheet for the 'awls, brad complete.'

"Imagine an ironmonger performing such accounting stunts whenever he sold a twopenny bradawl!

"And we did all this in war-time!

"Later, I believe, the decision of the conference was reversed by a Court of Appeal, and the 'awls, brad, blade' were made B Stores, and the 'awls, brad, handles' A. I have heard rumours since that they have both been made A by a yet higher Court of Appeal, and each time the decision has been altered the clerks have had to open up new Cards or Ledger Sheets.

"Every alteration meant work. Sometimes Ledgers were washed out, sometimes the Cards and the work of altering the system had to be done simultaneously with the daily routine. No wonder we required 250,000 Airmen in the R.A.F."

"There were worse troubles than that," said another Officer. "I once amused myself by counting the number of letters that had to be written in order to obtain a certain engine spare that was not an authorised issue. You know in order to limit the number of spares that had to be stocked at the depots lists were drawn up of the parts home Squadrons might demand when engines needed repairs. If a part required was not on the list the O i/c E.R.S. asked the E.O. to obtain it. The E.O. wrote in triplicate to the Wing E.O., who wrote in triplicate to the Group H.Q., which wrote to the Area H.Q., which wrote to the Air Ministry. The Air Ministry possibly inquired of the Depot, which probably had not got the part, so the Ministry of Munitions had to be approached and requested to place an order with the contractor concerned.

"It is practically certain that in the long chain someone would have forgotten to quote the schedule number of the part required, so that the contractor would pass back an inquiry to the Minister of Munitions, who would notify the Depot, which would inform the A.M., who would request the Area Headquarters to instruct the Group to ask the Wing E.O. to obtain from the Squadron E.O. an explanation as to why the part number was not given.

"By this time the O i/c E.R.S.s if he knew his job would have taken the spare required from a badly crashed engine, a thing he was not supposed to do, and would carefully have forgotten to inform the E.O., who would write to the Wing E.O. to say that he quoted the part number in his original letter. The Wing E.O. would pass this information *via* the Group H.Q., Area H.Q. A.M., Depot, and M. of M. to the contractor, who would reply that he might have done so, but that it was not in the letter he received, so the matter would be referred back again.

"All this might have taken a couple of months. By the time the contractor received the information he required it is probable that the engine had been declared obsolescent, and an order issued that no further spares would be issued."

"And yet we won the war," commented one of the party.

"Not because of, but in spite of, our methods," said the Officer who had started the discussion. "The work of equipment was a tremendous task, but it was over-organised. We were not tied up in red tape, but in sticky adhesive tape."

"What we want to do now in the organisation of the Peace Establishment is to simplify the system. Those who actually did the work know the difficulties, and they are the ones who ought to be consulted. Too much of the organisation has been built up by those who have not been through the mill themselves."

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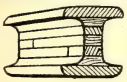
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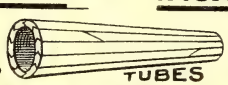
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ON THE REVIVAL OF ROMANTICISM.

Those who see Robert Loraine the actor as Cyrano de Bergerac will understand quite clearly how it came about that the old R.F.C. was divided distinctly between those who thought very highly of Lieut.-Colonel Robert Loraine, D.S.O., M.C., and those who hated him like poison. Probably one can say so much without being libellous or even offensive, for one is in this matter of the party of Le Bret rather than of de Guiche, and is oneself something of a specialist in the gentle art of making enemies.

The difference between Robert Loraine, R.F.C., and the authentic M. de Bergerac of the Gascon Company of the Guard of the King of France is a matter of some three hundred years more or less. *Tempora mutantur* a trifle, but, *mutatis mutandis*, de Bergerac who fought at Arras in Richelieu's day and Loraine who flew over Arras in Lloyd George's day are much of a muchness. It is not that the actor makes them the same, it is merely that they happen to have been born so.

Perhaps the best and briefest criticism of Robert Loraine's acting—*qua* acting—is contained in a letter from a *dégommé* R.F.C. officer who wrote to one the other day thusly :—"Having had Loraine as a superior officer, I hastened me to the Garrick with the idea of being able to hiss one who had been set over me. Not that he had ever done me any harm, just the principle of the thing, as learnt in the Air Force. I am sure he will now step into Tree's shoes. His Cyrano is really a top-hole performance."

There you have the heartfelt opinion of one who came to scoff and remained to praise. And if Robert Loraine does not like being compared to the late Sir Herbert, he must set down the young officer's saying as well intended.

And perhaps the best and briefest criticism of the play is contained in the words of one of our most brilliant aeroplane designers—which is to say, one of our greatest contemporary artists—who remarked with emotion as the curtain fell on the dead Cyrano :—"By God! With one or two little adjustments it would be *great*."

The Terrors of Translation.

It is certain that in the original French Cyrano de Bergerac is a great play. One has not had the opportunity of reading all of it in the original, but one can feel the greatness of the play in spite of the translation. And the genius and personality of Robert Loraine makes it the nearest thing to a great play that has been seen in London—outside the "Old Vic."—for many years. Therefore one has the greater grievance against the translators; or perhaps one should say one has the greater sympathy for them and their *traduction manquée*.

One's chief personal recollection of the original is the classic introduction of the Cadets of Gascoigne to de Guiche, beginning :—

"*Voilà les cadets de Gascoigne.*"

The translators have demoralised this gorgeous line to :—

"Cadets of Gascony are these."

It passes one's comprehension to understand how anybody with an ear for music, or a sense of the eternal unities, could turn so vital a phrase, with its fine swash-buckling flavour, into a line which seems fit only for the mouth of the Fairy Queen in a provincial pantomime. Even the voice of Robert Loraine can do nothing with that horrible pinched English "e" in "these" at the end of a line. It is as bad as the English operatic translation of Lohengrin's Narration which ends (on a big top note) with "And Lohengrin my name," as against the German "*Bin Lohengrin benannt.*" It is impossible to sing "name" or to declaim "these," but the broad "a" of "benannt" sings itself, and "Gascoigne" is itself a declamation, even if one neglects that unpronounceable final French "e."

There are many things that women can do better than men, but translating Rostand is evidently not one of them. The translation throughout lacks robustness, or what one believes is known in the theatrical profession as "guts."

If one had the choosing of translators one would have the job done in the first place by one Rex Hansard Brittain, whose joyous reviews of French flying books in this paper have shown his ability to turn the buoyant French of M. Jaques Mortane into English which holds all its fine French flavour, and then one would turn his translation over to Mr. Ernest Newman, the greatest musical critic in England and a master of English prose, so that the music of Rostand's verse should be re-established where necessary.

Little Adjustments.

As for the little adjustments which are needed, the most evident is that concerned with the scene before Arras. One cannot help feeling that if Cyrano had done less talking over the corpse of Christian and more fighting on the other side of the parapet the Spaniards would not have captured the redoubt so easily. The fault is Rostand's, but Robert Loraine is a big enough man to revise Rostand if so disposed.

One feels also that although Cyrano is justified in being "an unconscionable long time a-dying" he is perhaps a trifle too energetic in the last few minutes for any reasonable concussion case. He might well be helped onto his legs, as a concession to his wish to die standing, but one doubts whether he could spring to his feet under his own power.

The Cyrano Nose.

That, however, is a matter of opinion, and one's only real quarrel with Cyrano de Loraine is touching the delicate point of his nose. The Cyrano nose is purely a convention set up by M. Coquelin. And the nose of Cyrano de Coquelin need not be the nose of Cyrano de Loraine.

Let it be granted at once that the nose of Cyrano de Bergerac was "grotesque," "obtrusive," what you will. So were the honourable noses of the Duke of Wellington and of Mr. Joseph Chamberlain, and of Julius Cæsar and of Publius Ovidius Naso. Given that a Gascon of Cyrano's temperament had a nose such as any of these, one is justified in believing that it would weigh heavily on his soul, and that in moments of despondency he would denounce it as a snout, a trunk, a deformity. Yet it need not be an impossible nose, an example of elephantiasis or of acro-megaly, or some such abnormal development. There is really nothing in the play to show that Cyrano's nose was anything worse than one of such a size as to account for his being a shade touchy about it, whereas the Coquelin convention makes it frankly impossible, spoils the play by attracting one's attention—and the limelight—to it at the wrong moment, destroy's one's feeling for the reality of the whole play, and (worse than all) inflicts on Robert Loraine's splendid voice something perilously approaching a New England accent. One would like to see Cyrano de Loraine defy Cyrano de Coquelin and come forth boldly with a hawk-like Wellingtonian nose, such as befits the character. It is never too late to amend.

A Company of Artists.

Of the rest of the characters one may say that all are of a wonderfully level high quality. Miss Stella Campbell may or may not be a great emotional actress. She has no great opportunity for emotional acting, but as Roxane she does all that can be done with the part. Roxane is so evidently a clever fool that one has no sympathy for her as a heroine.

One longed for more of the fascinating voice and delightful presence of Miss Haidée Wright's Abbess. This charming lady is too frequently absent from the stage.

Mr. Gerald Lawrence as de Guiche is magnificent. He is the villain of the piece, but he remains a gentleman, and has a nice sense of humour.

Mr. Allan Jeayes should practice the declamation of those gorgeous Gascon names, for he loses something of an opportunity when introducing the Cadets de Gascoigne to Roxane at Arras. One needs almost a City toast-master to do justice to "Le Baron de Malgouyre Estressac Lébas d'Escarabiot."

The scene-painters, the costumiers, and those responsible for the training of the stage crowds deserve commendation equally with the members of the enormous cast who play throughout with unwonted skill, intelligence and sincerity.

The Resurrection of Romance.

Truly, here we have at last a play which is worth seeing. It is so nearly the perfect romantic play that one has criticised it somewhat at length because one would like to see it quite perfect.

Compared with the stage trash of the past ten years it is great. And the audiences show that the spirit of romanticism is very much alive.

As one left the theatre one brushed with a cigarette the arm of a complete stranger, a little officer-man, and one apologised as gracefully as possible, assuring him that one did not intend to use him as an ash-tray. With the true Cyrano air he turned and said: "I don't suppose you did. If I had thought so, I should have climbed up and hit you!" Then, realising that he was merely in London, he sighed and added: "Well! It is a great show, and I suppose that after this I shall be dragged off to some 'Hippodrome' or other."

Let it be Robert Loraine's reward that he has revived the true romance. But one does want to see him make those little adjustments.—C. G. G.

The Invasions of England.

The official reports of the London Fire Brigade on the 25 air raids on London between May 31st, 1915, and Whit-Sunday, May 19th, 1918, show that in all 859 bombs were dropped in the London County area, 372 being incendiary and 487 explosive With these, 473 persons were killed and 1,105 injured. Many of the latter died. In all, 11,194 premises were damaged, apart from those hit by anti-aircraft shells.

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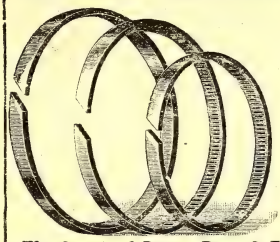
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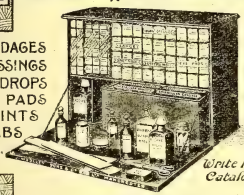
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THE TRANS-ATLANTIC COMPETITION.

During last week two further machines were entered for the "Daily Mail" trans-Atlantic prize. There are now seven British and one American competitors who intend to try for the prize.

Both the British and American Governments have entered machines, but they are not, of course, competing for the "Daily Mail" prize.

The Handley Page Attempt.

Mr. Handley Page entered one of the four-engined bombing machines, which is fitted with Rolls-Royce "Eagle" engines. It has a span of 126 feet and a petrol capacity of 2,000 gallons.

Major Trygve Gran, M.C., R.A.F., a Norwegian naval lieutenant who served with Capt. Scott in the Antarctic and who joined the R.A.F. under the name of Captain Grant, has been nominated as one of the pilots. The names of the other members of the crew have not yet been announced. Major Gran will be remembered for his daring flight from Aberdeen to Norway in 1914.

Boulton and Paul's Entry.

The other entry was made by Boulton and Paul, Ltd., of Norwich. The machine is described as the firm's post-war commercial model, and is fitted with two Napier "Lion" engines. The machine has a span of 59 ft. and is 40 ft. in overall length.

With 800 gallons of petrol, it weighs about 11,500 lbs. It is estimated that the machine will be capable of flying 3,850 miles at 116 m.p.h.

Mr. Hawker's Attempt

Mr. H. G. Hawker, who is piloting the Sopwith machine, i., at the time these pages go to press, ready to make a start. He intended starting on Saturday, but was obliged to postpone the attempt owing to rain and thick mist. A message from New York states that when 100 miles from land Mr Hawker proposes to drop the entire undercarriage into the sea, thereby increasing the speed of the machine by about 10 miles per hour owing to decreased head resistance. This is an American story.

Mr. Hawker will carry a letter from the Governor of Newfoundland to H.M. King George, and also various messages to newspaper offices. There has been no acceptance of the offer to carry private mail at £100 a letter, but some special stamps inscribed "First Trans-Atlantic Aero Flight" have been printed in Newfoundland.

The Martinsyde Machine.

Mr. Raynham, his passenger and machine have arrived at St. John's, Newfoundland. The pilot hopes to be able to start before the Sopwith crew, as he considers that the smaller aeroplane can start in worse weather than the larger machine. However, should the present unfavourable weather conditions continue for, say, a week, the Martinsyde machine should then be ready to start at the same time as Mr. Hawker. It will then be not only a test of endurance, but also of speed.

Air Ministry Announcements.

The Air Ministry made the following announcement on April 13th:—

Some confusion appears to exist with regard to the wireless call-signs allotted to aircraft for the trans-Atlantic flight.

Each machine is given a group of three letters (lying within the limits D K A to D M Z) which serve as a call-sign and as a rapid method of establishing the machine's identity.

Thus D K A is the wireless call-sign of the Sopwith machine competing in the trans-Atlantic flight.

The Air Ministry made the following announcement on April 13th:—

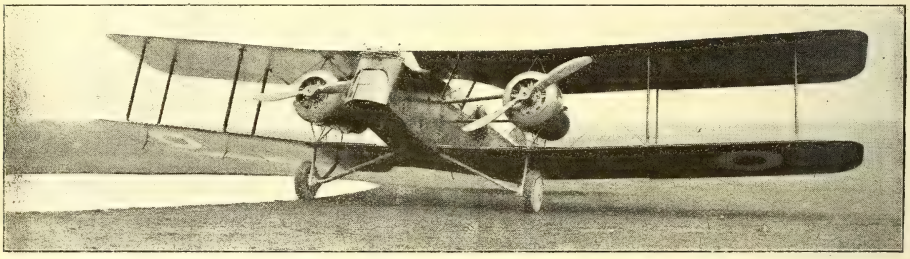
In order that full descriptive reports of the start of Major Wood from Ireland may, if possible, reach London in time for publication in the evening papers of the same day, the Air Ministry has arranged for an aeroplane to be ready to carry any Press accounts, photographs, and films of the start from near Limerick to London.

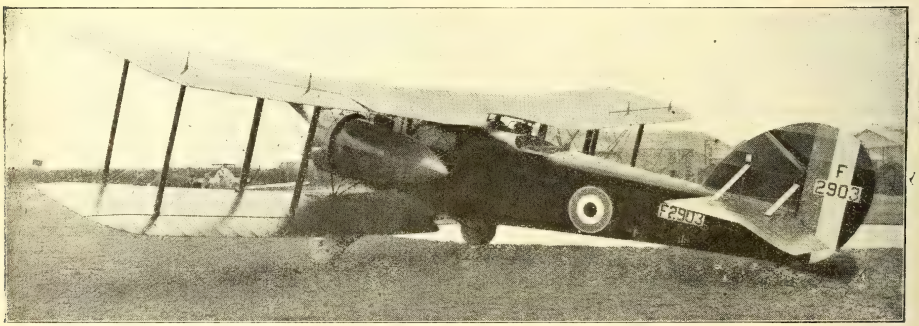
Packages of Press matter should be handed to the pilot addressed to the head offices of the newspapers concerned, by which arrangements should be made to collect them on arrival at Hendon Aerodrome, Headquarters, No. 86 Communication Wing, Royal Air Force.

The American Side.

A message from Far Rockaway, near New York, says that there is no chance of the American Naval machines entering the race this time. The idea seems to be to wait for the experience gained by the British aviators, and then, by hard work, make arrangements to attempt to establish new records.

All vessels leaving New York last week were notified to keep a close look-out on the Atlantic route, and to send all news to port by wireless. Some leading American newspapers lament that the first Atlantic flight should be attempted without a serious effort being made by America, and urge Washington to make an effort to stimulate flying by offering big rewards to experimenters.





THE TRANS-ATLANTIC B.P. BIPLANE.—The Type of Machine entered by Boulton and Paul, Ltd. In the Photograph it is shown with rotary Engines, but the Machine intended for the Trans-Atlantic Flight is to be fitted with two Napier "Lion" Engines, each of 450 h.p.

THE R.A.F. PICTURE SHOW.

Those who appreciated the excellent display of coloured photographs made by the Royal Navy some time ago, will appreciate still more the "War in the Air" Exhibition of coloured photographs organised by the Royal Air Force at the Grafton Galleries, Dover Street. No finer Exhibition of enlarged photographs has been seen and the novelty of the subjects, in the majority of cases, gives the Exhibition superiority over all others. Some of the photographs are either the same as, or very similar to, some which appeared in the Naval Exhibition, in that they illustrate war-ships photographed from the air, or are of Naval airships, but these are only a small minority, and, in any case, are well worth seeing again.

The Exhibition even has considerable technical interest in that there are some highly informative pictures of the methods used to allow aeroplanes to alight on, and start from, the decks of seaplane-carriers. Particularly interesting is one which shows an aeroplane fitted with skids instead of wheels which has just come to the end of its run after alighting on the wire mattress arrangement which was tried on "Furious."

One's only quarrel with the Exhibition as an exhibition is that a good many square yards of wall space which might have been devoted to pictures of actual aerial interest are devoted to pictures of grinning young women, who, though perhaps pleasing enough in themselves, are not directly concerned with war in the air and pertain properly to an Exhibition of women's war-work.

The worst part of the show is the catalogue, which appears to have been compiled in strict accordance with the very worst traditions of the cheapest illustrated papers. The wording is in the worst of bad taste, and there are several inaccuracies.

The old silly newspaper story about the German Air Service deliberately bombing hospitals is revived in two pictures which can be equally well explained on quite different hypotheses.

The astonishing statement is made in relation to one picture that Chief Mechanic Newell, who appears in the picture, was the first man to make a parachute descent from an aeroplane. One is under the impression that this feat was first done by M. Pégoud, and, in any case, several descents were made by passengers on aeroplanes with parachutes in France before the feat was attempted in this country.

How little the compiler of the catalogue knew about war in the air is shown by a photograph to which is attached the legend, "Pilots of a gallant R.A.F. Scouting Squadron which has done splendid work in France. They have made secrecy impossible in modern warfare." The picture shows the pilots of a fighting squadron—which is commonly and entirely erroneously called a "scout" squadron, though, in fact, the scout pilots are about the only people in the R.A.F. who do no scouting, and, therefore, do nothing to make secrecy impossible.

If one may accept any statement in the catalogue as being accurate a cherished illusion is destroyed by the statement that, "the splendid coloured enlargements are the work of Messrs Raines and Co., The Studios, St. Mary's Road, Ealing, W.5." One confesses to having been under the impression that the enlarging and colouring was the work of some real artist in the Photographic section, R.A.F., but, apparently the R.A.F. is only responsible for the taking of the photographs and for the production of the catalogue. On one, at any rate, of these performances, the R.A.F. is to be congratulated. But, undoubtedly, Messrs. Raines and Company deserve the highest possible compliments for their magnificent work.

It would have been quite possible to have done the catalogue in a properly dignified manner, and to have increased the interest of the stories belonging to each picture. The titles of the pictures as given in the catalogue resemble the headlines of cheap newspapers, and the whole production is full of that flag-flapping jauntiness and vulgarity of phrase, which, though it is the hall-mark of the cheaper news-sheets, is the last thing in the world to give a true impression of the atmosphere of the King's Services.

A certain number of the photographs—which are not by any means the most interesting—are published as a souvenir of the Exhibition at the moderate price of 1s., that is to say, the price is moderate for the photographs, though the inscriptions to the photographs are evidently compiled on the same lines as the catalogue, for they contain various inaccuracies, and have the same jaunty vulgarity.

Two interesting photographs show a seaplane stuck to the top of a wireless mast, and the inscription says, that "a R.A.F. man swarmed up and rescued the pilot." As a matter of fact, he was rescued by one R.N. and two R.N.R. ratings, who received the Albert Medal for their gallant act. The R.A.F. did not exist at that time, and, even so, the ratings were not the R.N.A.S. nor were they men of the R.F.C.

In a picture of one of our M Class submarines which carries a 12-in. gun, it is stated that "a battleship of the pre-Dreadnought class did not carry a gun of much larger calibre than this." As a matter of fact neither the pre-Dreadnoughts nor the Dreadnoughts themselves carried a larger gun than a 12-in.

An exceedingly pretty photograph of the Firth of Forth, showing the Forth Bridge and part of the British Fleet is described as "Moonlight in the Firth of Forth." It appears, however, to have been taken in the face of the setting sun, and one fails to see why it was necessary for the compilers of the catalogue thus to mislead the readers.

Be that as it may, barring the wording of the catalogue and the souvenir, the Show is eminently worth seeing.—C. G. G.

The Royal Aero Club.

A Special Meeting of the Committee was held on Tuesday, the 8th inst., when there were present:—Lieut.-Col. F. K. McClean (in the Chair), Mr. Ernest C. Bucknall, Lieut.-Col. Spenser D. A. Grey, D.S.O., R.A.F., Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F., Lieut.-Col J. T. C. Moore-Brabazon, M.P., Lieut.-Col. Alec Ogilvie, R.A.F., Mr. T. O. M. Sopwith, and Mr H. E. Perrin (Secretary).

Chairman.—Brig.-Gen. The Duke of Atholl, K.T. M.V.O., D.S.O., was unanimously elected Chairman for the current year.

Vice-Chairman.—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., was unanimously elected Vice-Chairman for the current year.

Sub-Committees.—The following Sub-Committees were appointed:—

Flying Services Fund Committee.—Mr. Chester Fox, Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F., Lieut.-Col. C. E. Maude, R.A.F., Brig.-Gen. R. H. More, C.M.G.

Finance Committee.—Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Lieut.-Col. J. T. C. Moore-Brabazon, M.P., Mr. J. H. Nicholson, Lieut.-Col. Alec Ogilvie, R.A.F., Mr. T. O. M. Sopwith.

House Committee.—Mr. Ernest C. Bucknall, Capt. Ronald L. Charteris, R.A.F., Surgeon Herbert J. Corin, R.N.V.R., Mr. C. G. Greenhill, Mr. Henry Knox, Mr. J. Stewart Mallam, Lieut. N. C. Neill, R.N.V.R., Mr. J. H. Nicholson, Capt. E. V. Sassoon, R.A.F.

"Daily Mail" £10,000 Trans-Atlantic Flight.—The following further entries for the "Daily Mail" £10,000 Trans-Atlantic Flight were reported:—

Handley Page, Ltd.

Federation Aeronautique Internationale — Resolutions passed by the Aero Club de France regarding the Central Powers were discussed and the delegates of the Club appointed to attend the inter-allied meeting of the Fédération Aéronautique Internationale in Paris on April 11th, 1919, were instructed as to the views of the Committee.

Owing to the inability of Lieut.-Col. F. K. McClean to attend the meeting in Paris, Lieut.-Col. Alec Ogilvie was appointed to take his place.

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Secretary.—H. E. Perrin.

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Subscriptions.

Total subscriptions received to April 1st, 1919	£14,935	5s. 5d.
Balance from Comforts Fund, Sick Quarters, No. 7 O.S.A., Royal Air Force, Bath ...	5	15s. 8d.
Total, April 8th, 1919 ...	£14,941	1s. 1d.

To Canadian Aviators.

Canadians of all ranks in the R.A.F. who are interested in co-operation for military, commercial, and social purposes on their return to Canada are invited to write to "Canfly," c/o The Aeroplane, 166, Piccadilly, W.1, giving their names and addresses.

As stated last week, this has nothing to do with an employment agency, nor is it concerned with a register of pilots. It is merely an effort on the part of a Canadian officer, who is returning to Canada, to keep Canadian aviators in touch with developments and with one another.

NAVAL & MILITARY AERONAUTICS

FROM THE "LONDON GAZETTE."

Air Ministry. April 8th.

R.A.F.—The following temp. appointment is made at the Air Ministry :—Staff Officer, 3rd Cl.—(T.) J. B. Walker (temp. Capt., R.E.), and is granted a temp. commn. as Capt, April 1st, 1918.

The following temp. appointments are made :—Staff Officer, 1st Cl. —(T.) Capt. (actg. Lt.-Col.) H. A. P. Disney, and to retain the actg. rank of Lt.-Col. whilst so empld., Jan. 28th to March 31st.

Staff Officers, 2nd Cl.—(P.) Maj. G. R. Moser, Feb. 14th to March 4th ; Capt. (actg. Maj.) W. F. Kendall, and to retain the actg. rank of Maj. whilst so empld., March 5th.

Staff Officers, 3rd Cl.—And to be actg. Capts. whilst so empld., if not already holding that rank :—(P.).—Sec. Lt. (actg. Lt.) R. Wight, Feb 14th; Lt. J. A. W. Bourne, Feb. 18th; Capt. N. Robertson, Feb. 19th.

Flying Branch.—Lt.-Cols. to be Lt.-Cols. (A.) :—(Actg. Brig.-Gen.) F. V. Holt, C.M.G., D.S.O., and relinquishes the actg. rank of Brig.-Gen., April 1st; C. H. K. Edmonds, D.S.O., O.B.E., from (S.O.), April 1st; R. Williams, D.S.O. (Lt.-Col., Aus. F.C.), is granted a temp. commn. as Lt.-Col. (A.), June 28th, 1918.

Capt. H. McIntjes, M.C., to be actg. Maj whilst empld. as Maj. (A.), Oct. 1st, 1918; Capt. G. Donald, D.F.C., to be actg. Maj. whilst empld. as Maj. (A. and S.), Aug. 30th, 1918.

Capt. W. J. de Salis, D.S.C., to be graded for pay as Capt. whilst empld. as Capt. (A. and S.), Aug. 8th, 1918; Lt. (actg. Capt.) J. W. B. Leigh, M.C., retains the actg. rank of Capt. whilst empld. as Capt. (A.) from (T.), March 31st; Lt E. A. Coghlan to be act Capt. whilst empld. as Capt. (A.), Dec 1st, 1918; Lt. (Hon. Capt.) R. Lindsay to be actg. Capt. whilst empld. as Capt. (O.), Sept. 26th, 1918.

Sec. Lt. H. Jones (late Gen. List R.F.C., on prob.) is confirmed in his rank as Sec. Lt. (A.), Oct. 27th, 1918; A. A. McConnell, M.C. (temp. Lt., Durham L.I.) is granted a temp. commn. as Sec. Lt. (Observer Officer), and to be Hon. Lt., Oct. 25th, 1918; F./Cadet 178057 D. C. Pollock is granted a temp. commn. as Sec Lt. (Observer Officer), Oct. 31st, 1918.

The following relinquish their commns. on ceasing to be empld :—

Lt. F. C. Higgins (Lt., Can. F.A.), Jan. 1st; Lt. R. G. Atkinson (Lt. Quebec R.), Jan. 31st; Sec. Lt. H. Walker (Sec. Lt., Manc. R.), Feb. 24th; Lt. J. F. White (Lt., C. Ont. R.), Feb. 26th; Lt. J. B. Case (Lt., I.A.R.O.), Feb. 27th; Sec. Lt. W. J. Goddard (Sec. Lt., M.G.C.), Sec. Lt. (Hon. Lt.) J. B. Hutcheson (Lt., Sask. R.), March 6th; Sec. Lt. (Hon. Lt.) R. E. Davidson (Lt., Can. F.A.), March 14th; Lt. H. M. Thomas (Lt., R. Col. R.), March 21st.

The following are transferred to unempld list :—Lt. J. U. McKinnon, Jan. 7th; Lt. A. Bechervaise, Sec. Lt. J. H. Hall, Jan. 15th; Sec Lt. E. Shufflebotham, Jan. 16th; Lt. (actg. Capt.) A. Sleep, Jan. 18th (substituted for notification in "Gazette," March 18th), Lt. O. F. Meyer, Jan. 21st; Maj. W. P. D. Ackland, M.C., (Devon Yeo.), Jan. 22nd; Lt. (Hon. Capt.) G. H. Simpson, Jan. 24th (substituted for notification in "Gazette," Feb. 25th); Lt. A. E. Baling, Sec. Lt. A. S. Wright, Jan. 25th; Sec. Lt. J. L. Sleigh, Jan. 26th; Sec. Lt. W. Mackay, Jan. 27th; Lt. D. F. H. Brickell, Jan. 28th; Maj. J. C. Griffiths, Sec. Lt. H. C. Glassford, Jan. 29th; Lt W. A. George, Jan. 31st; Sec. Lt. D. A. Banfield, Feb. 2nd; Sec. Lt. L. H. French, Lt. J. R. Paisley, Sec. Lt. R. F. D. Parker, Feb. 5th, Sec. Lt. A. Peak, Feb. 6th; Lt. C. W. N. Raymond, Feb 7th; Lt. (actg. Capt.) C. Parry, D.F.C., Feb. 8th; Capt. E. G. S. Walker, Feb. 9th; Capt. H. A. Peck, Sec. Lt. G. N. Peck, Feb. 10th; Sec. Lt. C. Fletcher, Sec. Lt. F. Marshall, Sec. Lt. (Hon. Lt.) N. H. N. McLeod, Feb. 11th; Lt. G. H. Wackrow, Feb. 12th; Lt. R. McLaughlin, Sec. Lt. J. A. Robertson, Feb. 13th; Lt. (Hon. Capt.) H. C. Atkinson, Feb. 14th; Lt. G. H. Hobson, D.F.C., Sec. Lt. G. A. Hood, Sec. Lt. A. G. McLauchlan, Feb. 15th; Lt. G. G. W. Petersen, Lt. F. M. Panzetta, Feb. 18th; Lt. J. M. Allen, Lt. K. C. Cowl, Feb. 19th; Lt. H. M. Petty, Lt. (actg. Capt.) R. Pattisson, Sec. Lt. R. T. Watkins, Lt. A. C. Hendrson, Lt. Young, Feb. 21st; Sec. Lt. G. H. Pearce, Sec. Lt. J. Pate, Sec. Lt. G. E. Wales, Feb. 22nd; Sec. Lt. A. Dewhurst, Lt. O. Pearson, Lt. K. de Pass, Feb. 23rd; Lt. K. W. Payne, M.C., Lt W. L. Yorath, Sec. Lt. A. J. Young, Feb. 25th; Lt. J. H. Patterson, Lt. A. C. T. Perkins, Sec. Lt. S. D. A. Partridge, Feb. 26th; Sec. Lt. R. Parker, Feb. 27th; Sec. Lt. D. Cyrus, Lt. E. A. Hamilton, Lt. (actg. Capt.) W. J. Peace, D.F.C., Feb. 28th; Lt. F. Matthews, Lt. H. E. W. MacAndrew, March 1st; Lt. H. J. F. Alexander (R.F.A., T.F.), Sec. Lt. S. Horscroft, March 2nd; Sec. Lt. J. Formstone, Sec. Lt. J. Hamilton, Lt. D. McLaurin, Lt. G. F. Mackay, March 4th; Lt. O. W. E. Crawford, Lt. R. C. Talbot, Sec. Lt. W. R. Witton, March 5th; Lt. J. F. Read, Lt. L. C. Walker, March 6th; Sec. Lt. J. Royworth Hill, March 7th; Lt. J. F. Drake, D.F.C., Lt. R. H. Gautrey, Lt. (actg. Capt.) J. D. T. Hardman, D.F.C., Sec. Lt. L. F. King, March 8th; Sec. Lt. L. D. Abecasis, Lt. (Hon. Capt.) J. H. S. Alexander (Dev. Yeo.), Sec. Lt. (Hon. Maj.) G. R. Crosfield, D.S.O. (S. Lanc. R., T.F.), Lt. W. A. Merrill, March 10th; Sec. Lt. Ewen, Sec. Lt. Hendrson, Lt. E. T. McC. Routledge, March 11th; Sec. Lt. D. R. Dunn, Lt. R. Hall, Sec. Lt. J. E. Mavity, March 12th; Sec. Lt. H. C. Brown, Sec. Lt J. C. Lewis, March 13th; Lt W. H. Boston, Lt. R. J. Baddeley, (Manc. R., T.F.), March 14th; Lt. L. J. Aitken, Lt. D. H. Bevan, Sec. Lt. F. H. Davies, Sec. Lt. R. Parker, Sec. Lt. C. A. Smith, March 15th; Lt. J. H. Bentham, Lt. S. Chadwick (R.A., T.F.), Sec. Lt. A. J. Fryer, March 16th; Sec. Lt. F. Bennett, Sec. Lt. B. A. Levy, March 17th; Lt. F. H. Barton, Sec. Lt. E. W. C. Densham, Capt. A. M. FitzRandolph, Sec. Lt. (Hon. Lt.) C. G. Smyth-Piggott, March 18th; Sec. Lt. G. C. Bull, Sec. Lt. L. A. Combes, Sec. Lt. A. A. Fordham, Sec. Lt. A. Fairley, Sec. Lt. F. Fraser, Lt. E. P. O. Haughton, Lt. J. Johnstone, Lt. F. W. Pearson, Sec. Lt. Courtnay, Sec. Lt. A. J. Ward, Lt. C. S. Whellock, March 19th; Sec. Lt. T. Calvert, Sec. Lt. H. S. Howard, Lt. Hon A. J. W. Keppel, Sec. Lt G. H. Metcalfe, Sec. Lt G. P. Maffey, Sec. Lt J. C. Urquhart, March 20th; Lt. A. F. Beckett, Sec. Lt. T. Eden, Maj. F. D. Stevens, Sec. Lt B. H. Wilson, March 21st; Sec. Lt. W. L. Arnold, Sec. Lt. A. J. Ord, Lt. R. A. West, Lt. H. White, Lt. W. L. A Wilkinson, March 22nd; Sec. Lt. C. A. Begg, Lt. J. M. Bright, Lt (actg. Capt.) G. Bremridge, A.F.C., Sec. Lt. A. A. Caney, Sec. Lt F. M Clark, Lt. F. V.. Chapman, Sec. Lt R. A. Hawman, Sec. Lt. H. W Harper, Sec. Lt. J. W. H. Lett, Sec. Lt. L. V. West, March 23rd; Sec. Lt. D. A. Alexander, Lt. (actg. Capt.) E. J. Addis, D.F.C., Lt. G. S. Bennett, Capt. F. P. Collins, Lt. F. L. Morrison, Sec. Lt. N. Purtell, Sec. Lt J. Tee, M.C., March 24th; Sec. Lt. G. A. Atkinson, Sec. Lt. E. M. Buckley, Lt. E. S. Davidson, Sec. Lt. E. C. Eastwood, Maj. C. T. Freeman, Lt. W. Hart, Sec. Lt. E. A. Kemp, Sec. Lt. J. I. Laing, Lt. E. A. Richardson, March 25th; Sec. Lt. L. F. H. Bird, Sec. Lt. H. A. F. Barker, Lt. J. Chatterton, Sec. Lt P. Chauncy, Lt. H. J. H. Dicksee, Lt. J. Dale, Sec. Lt. E. M. Hook, Lt. W. Iles, Sec. Lt. C. Kipling, Sec. Lt. F. W. King, Lt. C. J. Lusted, Lt. A. Lilley, Sec. Lt. D. F. Martin-Smith, Lt. (actg. Capt.) A. Rice-Oxley, Sec. Lt. L. L. Veryard, March 26th; Sec. Lt. H. C. Durant, Lt. H. T. Flintoft, Lt A. W. Gurney.. Sec. Lt. L. H. Howard, Capt. (actg. Maj.) L. A. Hervey, Lt. (actg. Capt.) A. S. Hemmings, Lt. H. E. Riley, March 27th; Capt. G. K. Blandy, Sec. Lt. C. C. Davis, Sec. Lt. H. C. B. Freeman, Sec. Lt. L. G. Farrant, Lt. J. J. Gaynor, Sec. Lt. P. Hopkinson, Sec. Lt. R. E. Hagley, Sec. Lt. J. Hackett, Lt. R. C. W. Jervois, Sec. Lt. N. P. Jones, Sec. Lt. E R. Williams, March 28th; Sec. Lt. F. E. Asboe, Sec. Lt. C. Brears, Lt. S. G. Brown, Sec. Lt. H. Chappells, Capt P. W. Hawkins, Lt. C. A. Hyde. Sec. Lt. H. T. Hemsall, Sec. Lt. W. F. Jaggs, Lt. L. S. Wooding, March 29th; Lt. A. Critchley, Lt. W. E. Giffard, Sec Lt. (Hon. Capt.) O. H. Hadley, Lt. G. Henderson, Lt. R. Hunt, March 30th; Capt. D. D. Drury, March 31st; Lt. L. H. Capel, Lt. W. F. Carson, April 8th.

Sec. Lt. E. J. N. Finlayson is dismissed the Service by sentence of a General Court-Martial, Dec. 25th, 1918.

The following relinquish their commns. on account of ill-health, and are permitted to retain their rank :—G. Bryer-Ash (Wilts. R.) (contracted on active service), J. Kyle (contracted on active service), D. W. Lees (caused by wounds), R. G. Pratt, E. H. Penberthy (Lond. R, T.F.), April 9th.

The following has relinquish their commns. on account of ill-health :—A. Mann (R.F.A., Spec. Res.) (contracted on active service), S. D. Morrison (Nova Sco. R.), April 9th.

The following Sec. Lts relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank :—H. E. Light, C. W. Mann, G. R. Newton-Biddle, Lt. C. Roberts, April 10th.

The surname of Lt. (actg. Capt.) H. V. Robins, M.C., is as now described and not as stated in the "Gazette," July 12th, 1918.

The Christian name of Sec. Lt. Harry Holsten Wilson is as now described and not as stated in the "Gazette," Sept. 6th, 1918.

The Christian names of Sec. Lt. Gabriel John Erasmus Boyd are as now described and not as stated in "Gazette," Nov. 22nd, 1918.

The initials of Lt. (actg. Capt.) F. D. Grant are as now described and not as stated in "Gazette," Dec. 6th, 1918.

The notification in "Gazette," Aug. 20th, 1918, concerning Lt. A. Sartin is cancelled.

The notification in "Gazette," Jan. 21st, concerning Lt. T. Stewart (R. Fus. R.) is cancelled.

The notification in "Gazette," Feb. 14th, concerning Sec. Lt. S. A. Pindar is cancelled.

The surname of Lt. (Hon. Maj.) E. C. Carver, D.S.O., is as now described and not Carner, as stated in "Gazette," March 18th.

Administrative Branch.—Capt. A. M. Wilson to be actg. Maj. whilst empld. as Maj., June 12th, 1918.

Lts. to be actg. Capts. whilst empld as Capts. :—C. H. Young, July 1st, 1918; (Hon. Capt.) J. F. C. Bennett, Nov. 1st, 1918; C. R. R. Gidney (Hon. Capt.) F. C. McBride, Dec. 1st, 1918.

Capt. C. D. Smart, M.C., to be Lt., from (A), and to be Hon. Capt., June 3rd, 1918 ; substituted for notification in "Gazette," Feb. 14th.

Lts. (A.) to be Lts. :—A. Holden, March 4th; H. I. Pole, March 15th.

Lts. (R.B.) to be Lts. :—R. G. C. Pinfield, Nov. 1st, 1918; H. F. Barnes M.C., March 6th.

C. P. Smith (Lond. and Ormr., Spec List) is granted a temp. commn. as Lt., April 1st, 1918, and to be Hon Capt (substituted for notification in "Gazette," Feb. 14th).

Sec. Lt. H. J. Challis to be Sec. Lt., from (A and S.), Nov. 26th, 1918.

Sec. Lt F. R. Stewart (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt., March 3rd.

N Bucknall is granted a temp. commn as Sec. Lt., March 25th.

The following relinquish their commns. on ceasing to be employed :—Lt. R. N. D'O. Earwaker (Lt., Man. R.), Feb. 12th; Lt. J. A. Clarke (R.A.), Feb. 22nd; Lt W. MacDonald (Lt. R. W. Surr. R.), March 14th.

The following are transferred to unemployed List :—Sec. Lt. S. D. Good, Jan. 25th; Sec. Lt. H. F. Walker, Jan. 28th; Sec. Lt. F. H. Reynolds, Feb. 2nd; Lt. T. D. Penrice, Feb. 5th; Lt. T. Lethbridge, Sec. Lt. W. Pease, Feb. 12th, Sec. Lt. G. H. Green, Lt. V. G. B. Parton, Feb. 13th; Lt. (Hon. Capt.) L. Chilvall (late Capt., R.A.S.C.), Sec. Lt. W. Bell, Feb. 16th; Sec. Lt. H. S. G. Palmer, Feb. 20th; Sec. Lt. A. J. Penaluna, Feb. 21st; Sec. Lt E. C. Fisher, Sec. Lt B. E. Hawkins, Lt R. MacC. Marshall, Feb. 23rd; Sec. Lt. (actg. Capt.) F. R. T. Pearson, Feb. 25th; Capt. J. W. Higgins, Lt. A. C. Riddell, Feb. 26th; Lt. F. R. Pender, Feb. 28th; Sec. Lt. D. B. Horsbrugh, March 4th; Sec. Lt. E. Mallin, March 10th; Lt. J. Duncan, March 11th; Sec. Lt. E. G. Barratt, Lt. E. A. De Sain, Capt. A. H. Sutton, March 17th; Capt. E. C. Winkley, March 19th; Sec. Lt. J. R. Stovell, March 21st; Sec. Lt. A. Anderson, Sec. Lt. R. Bolton, March 22nd; Sec. Lt. C. G. Kemp, March 23rd; Lt. H. S. Bloodworth, Capt. A. W. W. Groome, Capt. R. A. Wilton, March 24th; Lt. B. R. Agus, Sec. Lt J. Colquhoun, Lt. (actg. Capt.) A. D. Collins (Capt., Worc. R.); Lt. C. A. Howe, Sec. Lt. V. T. Lloyd-Davis, Capt. J. L. Lucena, Sec. Lt. (actg. Lt.) R. I. Paiba, March 25th; Sec. Lt. C. W Hewson, Sec. Lt. G. Jones, Capt. C. G. Lord, M.C., Sec. Lt. W. S. Logsdon, March 26th; Capt. R. Dewar, Capt. W. J. Liberty, March 27th; Capt. J. R. Deronet, Sec. Lt R. Holland, Sec. Lt. W. R. Westland, March 28th; Sec. Lt. W. Lee, March 29th; Sec. Lt. J. J. Brown, April 1st; Lt. J. W. New (Middx R.), April 7th.

Lt. (actg. Capt.) F. M. Drake relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Capt. April 9th.

Lt A. J. Bird relinquishes his commn. on account of ill-health

contracted on active service, and is permitted to retain his rank, April 9th.

Sec. Lt. H. G. Booth resigns his commn., April 9th.

The initial of Capt. J. Williams is as now described, and not as stated in "Gazette," March 14th.

The surname of Sec. Lt. J. Earle-Wilson is as now described, and not as stated in "Gazette," March 25th.

The notification in "Gazette," Nov. 1st, 1918, concerning Lt. P. J. Harris is cancelled.

The notification in "Gazette," March 21st, concerning Sec. Lt. R. C. Dickinson is cancelled.

TECHNICAL BRANCH.—Lt.-Col. A. V. Bettington, C.M.G., to be actg. Col. (without pay and allces.) whilst empld. as Col. from (S.O.), Feb. 3rd.

Capts. to be Capts. (Grade A.), from (Ad.):—A. B. Davies, April 1st, 1918 (substituted for notification in "Gazette," Dec. 24th, 1918; B. H. Brodie, Sept. 26th, 1918.

Capt. W. H. Sharpe to be Capt. (Grade B.), from K.B., Jan. 26th.

To be actg. Capts. whilst empld. as Capts. (Grade A.):—Sec. Lt. (Hon. Lt.) (actg. Lt.) D. L. Hollis, Lt. J. D. Whiteman, Oct. 1st, 1918.

To be actg. Capts. whilst empld. as Capts (Grade B.):—Lt. A. W. Fayne (from Sept. 1st, 1918, to Jan. 10th); Sec. Lt. F. G. Murray, Feb. 18th.

V. P. Turner (Lt. Australian Flying Corps) is granted a temp. commn. as Lt. (Grade A.), July 24th, 1918.

Lts. to be Lts. (Grade A), from (Ad.):—N. H. Mackrow, Aug. 18th, 1918; (Hon. Capt.) C. B. Smart, M.C., Feb. 10th.

Lts. to be Lts. (Grade B.), from (Ad.):—M. P. Lewis, Dec. 6th, 1918; S. D. Dennis, March 10th.

Sec. Lt. R. M. Duke to be actg. Lt. whilst empld. as Lt. (Grade A.), Oct. 1st, 1918.

Sec. Lt. J. M. Brown to be Lt. (without pay and allces. of that rank), Sept. 16th, 1918.

Sec. Lt. (actg. Lt.) H. S. G. Jamieson to be Lt., Sept. 23rd, 1918.

Sec. Lts. to be actg. Lts. while empld. as Lts. (Grade B):—(Hon. Lt.) N. W. Walmsley, M.C., from (O.), July 20th, 1918 (substituted for notification in "Gazette," Dec. 17th, 1918); W. H. Saunders, Dec. 20th, 1918.

Sec. Lts. to be Sec. Lts. (Grade A), from (Ad.):—A. J. Brown, M.C., Sept. 1st, 1918; M. Worms, Oct 25th, 1918; W. C. Brown, Feb. 8th; H. F. Hickey, Feb. 10th (substituted for the notification in "Gazette," March 25th).

H. Marsden, Cpl.—Lt., Manch. R., T.F., is granted a temp. commn. as Sec. Lt. (Grade B), Sept. 19th, 1918 (substituted for the notification in the "Gazette," Jan. 7th).

The following are transferred to unempld list:—Sec. Lt. (Hon. Lt.) J. McChesney (Lt., R. Fus.), Jan. 13th; Lt. H. V. Roe, Jan. 22nd; Sec. Lt. J. Armitage, Jan. 23rd; Capt. F. A. Appleby, Jan. 24th; Lt. (actg. Capt.) W. Bell, Jan. 28th; Capt. (actg. Maj.) J. E. Arrol-Hunter, Sec. Lt. I. A. Carr, Feb. 1st; Sec. Lt. W. E. Andrews, Feb. 4th; Sec. Lt. W. Tocher, Feb. 6th; Capt. B. Davies, Lt. A. J. Howell, Sec. Lt. F. M. Thomas, Feb. 11th; Sec. Lt. (actg. Lt.) H. S. Askew, Lt. E. Marsden, Sec. Lt. J. H. Pattman, Lt. (actg. Capt.) J. Page, Hon. Lt. R. Hibbard, Feb. 17th; Lt. (actg. Capt.) J. W. V. Paul, Capt. W. R. Parsonage, Sec. Lt. A. S. Wall, Feb. 19th; Sec. Lt. W. Gardner, Sec. Lt. H. Wagner, Feb. 20th; Sec. Lt. W. F. Wallace, Feb. 25th; Lt. J. H. Chester Walsh, Capt. J. W. Grundy, Feb. 26th; Lt. F. T. Ashford, Feb. 27th; Lt. (Hon. Capt.) C. L. Hardy, Feb. 28th; Lt. E. M. A. Van Der Meersch, March 1st; Sec. Lt. W. G. Lorraine, March 2nd; Sec. Lt. F. G. Willis, March 9th; Capt. B. E. Annoot (substituted for notification in "Gazette," March 28th), Lt. F. A. Thomas, March 13th; Sec. Lt. V. M. Adamson, Lt. D. F. Winch, March 17th; Sec. Lt. E. H. Edleston, Lt. (actg. Capt.) A. C. Truelove, March 19th; Sec. Lt. (Hon. Lt.) D. R. C. Hunt, Lt. C. H. Richards, Sec. Lt. N. Smith (R.G.A., Spec. Res.), Capt. L. P. Timmins, March 20th; Capt. G. H. Higginson, March 21st; Sec. Lt. O. Charlton, March 23rd; Lt. S. S. Barber (Devon. R.), Sec. Lt. (Hon. Lt.) C. T. Clarke, Major R. E. Cook, Sec Lt. G. V. Grundy, Capt. W. N. Jones, March 24th; Lt. C. H. Aitken, Lt. (actg. Capt.) G. T. Bridgewater, Lt. (actg. Capt.) J. G. M. Bevan, Sec. Lt. (actg. Lt.) W. G. Burton, Lt. (actg. Capt.) L. P. Craven, Capt. A. E. Holder, Capt. W. M. Jones, Sec. Lt. (actg. Lt.) J. F. Lamonby, March 26th; Sec. Lt. (Hon. Capt.) (actg. Capt.) C. G. Carson, Lt. H. E. Carroll, Lt. A. G. A. Cazabon, Capt. C. A. Crow, March 27th; Sec. Lt. (actg. Capt.) F. R. Brighten, Lt. H. B. Dent, Sec. Lt. W. T. Daniell, March 28th; Capt. Hon. S. Kennett, March 30th; Capt. L. Aitchison, Capt. A. F. Allen, Sec. Lt. B. H. Bayliss, March 31st; Capt. A. D. W. Allen, Sec. Lt. M. C. S. Bowley, Lt.-Col. R. H. Collier, D.S.O., Capt. W. T. Curtis, Lt. (actg. Capt.) J. B. Crabb, April 1st.

The initials of Sec. Lt. (Hon. Lt.) (actg. Lt.) W. J. G. Barnes are as now described, and not as stated in "Gazette," July 9th, 1918.

The surname of Sec. Lt. (Hon. Lt.) (actg. Capt.) B. L. Blomley is as now described, and not Bromley, as stated in "Gazette." March 4th.

The notifications in "Gazette," March 7th, concerning the following Sec. Lts. are cancelled:—H. S. G. Jamieson, T. I. Grimes.

MEDICAL BRANCH.—W. Purcell, D.S.O., M.C. (Capt., actg. Lt.-Col. R.A.M.C.), is granted a temp. commn. as Lt.-Col., Nov. 22nd, 1918, with seny. from April 1st, 1918; Capt. C. F. A. Hereford to be Maj., Dec. 30th, 1918.

The following are granted temp. commns. as Lts.:—R. H. Parry, R. I. Rhys, April 7th.

The following are transferred to unempld. list:—Capt. T. B. Dixon, Feb. 3rd; Capt. P. W. McKeag, Feb. 28th; Capt. D. Guthrie, Mar. 8th; Capt. S. W. Fisher. Mar. 25th; Capt. W. F. Jones, Mar. 27th; Lt. E. L. Bunting, Capt. A. G. H. Smart, M. B., Mar. 28th.

The initials of Capt. J. P. I. Harty are as now described, and not as stated in "Gazette," Mar. 28th.

The notification in the "Gazette," Nov. 26th, 1918, concerning Capt. R. D. Neagle is cancelled.

MEDICAL (ADMINISTRATIVE) BRANCH.—Capt. H. R. B. Hull to be actg. Maj. whilst specially empld., Nov. 18th, 1918.

CHAPLAIN'S BRANCH.—Capt. C. B. Allen, M.A., is transferred to unempld. list, Jan. 5th (substituted for notification in "Gazette," March 4th).

MEMORANDA.—Lt.-Col. (actg. Brig.-Gen.) G. Livingston, C.M.G., is granted the hon. rank of Brig.-Gen., Feb. 14th.

The following Capts. are confirmed in the rank of Capts.:—P. B. Silk, A. W. Williams, D.F.C., W. F. Cleghorn, D.F.C., A. T. Barker, D.F.C., N. Grabowsky, A.F.C., A. M. Harding, V. E. Sieveking, D.S.C., E. R. Barker, D.S.C., W. O. F. Harding, K. C. Boyd, S. E. Ball, D.F.C., M. Hunter, W. H. Sharpe, B. H. Sisson, D. C. Page, D. C. Woods, W. L. Anderson, D.S.C., J. R. Blunt.

E. G. Knox (Capt., Aus. Flying Corps) is granted a temp. commn. as Capt., Oct. 11th, 1918.

Sec. Lt. B. Tamiriantz to take rank and precedence as if his appt. as Sec. Lt. bore date Feb. 28th.

The following Hon. Lts. relinquish their commns. on ceasing to be empld.:—B. J. Samuels, H. E. White, March 16th.

The following are transferred to unempld. list, from (S.O.):—Maj. (actg. Lt.-Col.) R. W. Roylance, Jan. 27th; Capt. (actg. Maj.) H. F. F. Birch (R.A.S.C.), Jan. 28th; Maj. C. R. Andrews, M.B.E., Feb. 1st; Capt. H. E. Parker, Feb. 5th; Capt. G. Elliott-Lockhart, March 8th; Lt. (actg. Capt.) E. L. Hyde, March 29th; Lt. (actg. Capt.) R. E. Johnson, March 31st; Capt. (actg. Maj.) A. Murray, April 1st; Capt. (actg. Maj.) S. C. Raffles, O.B.E. (R. Welsh Fus.), April 9th.

WAR OFFICE, April 10th.

The Secretary of State for War has received a Dispatch from Field-Marshal Sir Douglas Haig, K.T., G.C.B., G.C.V.O., K.C.I.E., Commander-in-Chief of the British Armies in France. The following extracts dealing with aircraft are taken from the Dispatch:—

I include in this Dispatch a brief review of the chief features of military interest which stand out among the operations of the British Armies on the Western front during the time I have been in command of them. I take this last opportunity also to refer by name to some few of the many able and gallant officers who have assisted me in my task, and to thank them personally.

The development of the Air Service is a matter of general knowledge, and figures showing something of the work done by our airmen were included in my last Dispatch. The combining of their operations with those of the other arms, and particularly of the artillery, has been the subject of constant study and experiment, giving results of the very highest value.

The great development of air photography, sound ranging, flash spotting, air-burst ranging and aerial observation brought counter-battery work and harassing fire both by day and night to a high state of perfection. Special progress was made in the art of engaging moving targets with fire controlled by observation from aeroplanes and balloons.

Under the general control of the Adjutant-General, the Base Stationery Depot, which went to France in 1914 with a personnel of ten, has expanded into the Directorate of Army Printing and Stationery Services, employing over 60 officers and 850 other ranks. In addition to the printing and distribution of orders and instructions, it undertook the reproduction on a vast scale of aerial and other photographs, the number of which grew from 25,000 in 1916, to two and a quarter million in 1918.

In his appreciation the Field-Marshal says:—

I recall with gratitude the magnificent work done during the fighting of 1916 and 1917 by Major-General Sir H. M. Trenchard, at that time commanding the Royal Flying Corps. The influence exerted by this able and distinguished officer upon the moral and the development of the British Air Service and in the creation of its splendid traditions can scarcely be exaggerated. Since his transfer to another but kindred field of activity, his work has been most ably and successfully carried on by Major-General Sir J. M. Salmond, commander of the Royal Air Force on the Western front.

WAR OFFICE, April 11th.

The following is an extract from a Dispatch which has been received by the Secretary of State, addressed to the Chief of the General Staff, India, by Lieut.-General Sir W. R. Marshall, K.C.B., K.C.S.I., Commanding-in-Chief, Mesopotamian Expeditionary Force:—

"In the dispositions for the attack on the Fatha position the R.A.F. were retained under the direct orders of the Army Commander.

"On October 24th, * * * the 17th and 18th Divisions followed up the retreating Turks, maintaining a continuous pressure, whilst the R.A.F. co-operated with low-flying aeroplanes which bombed and machine-gunned the enemy columns."

AIR MINISTRY, April 11th.

R.A.F.—The following temporary appts. are made at the Air Ministry:—Staff Officers, 1st Cl.—(T.)—Lt.-Col. R. W. Hogarth, April 1st, 1918.

Staff Officers, 3rd Cl.—(P.)—Lt. (actg. Capt.) E. E. Colquhoun, M.B.E., and to retain the actg. rank of Capt. whilst so empld., March 17th.

The following temp. appts. are made:—Staff Officers, 2nd Cl.— (O.)—Lt. (actg. Capt.) J. S. Goggin, and to be actg. Maj. whilst so empld., Jan 28th.

Staff Officers, 3rd Cl.—(Q.)—Sec. Lt. (Hon. Lt.) (actg. Lt.) J. A. Allen, and to be actg. Capt. whilst so empld, Jan 28th.

Air Attaché.—Maj. (actg. Lt.-Col.) Sir N. R. A. D. Leslie, Bt., C.B.E., and to retain the actg rank of Lt.-Col. whilst so empld., Nov. 30th, 1918.

FLYING BRANCH.—Lt.-Col. (actg. Col.) P. B. Joubert de la Ferté, C.M.G., D.S.O., to be Lt. Col. (A.), and relinquishes the actg. rank of Col., March 4th.

Lt. W. R. S. Humphreys to be Lt. (A.), from (T.), Feb. 22nd.

Sec. Lts. to be Lts.:—(Hon. Capt.) J. Macfarlane, and to retain his hon rank, Lt. (actg. Capt.) P. Carruthers, (Hon. Lt.) C. R. Sharman, April 2nd, 1918; F. J. Walsh, April 12th, 1918; (Hon. Lt.) J. C. Alderton, April 24th, 1918; (Hon. Lt.) J. C. F. Wilkinson, M.C., April 27th, 1918; (Hon. Lt.) H. W. Hollands, May 3rd, 1918; (Hon. Lt.) C. H. N. Ashlin, May 7th, 1918; (Hon. Capt.) G. S. Grant, and to retain his hon rank, Lt. (Hon. Lt.) J. C. Belford, May 10th, 1918; (Hon. Lt.) A. J. Thomas, May 11th, 1918; (Hon. Lt.) J. Glen, May 17th, 1918; (Hon. Capt.) J. Hewitt, and to retain his hon. rank, May 19th, 1918; (Hon. Lt.) R. H. Hampton, May 21, 1918; (Hon. Lt.) R. N. Haile, May 24th, 1918; J. S. H. Willis, May 29th, 1918; (Hon. Lt.) (actg. Lt.) H. S. Starkey, May 30th, 1918; A. L. Jordan, June 6th, 1918; A. M. Pearson, (Hon. Lt.) H. S. Noble, June 15th, 1918; (Hon. Lt.) J. McKeogh, C. H. Bates, June 16th, 1918; W. H. Thompson, June 18th, 1918; (Hon. Lt.) H. G. Strange, June 22nd, 1918; W. W. Mackinlay, July 3rd, 1918; F. S. Smith, July 14th, 1918; (Hon. Lt.) E. L. Trower, Aug. 22nd, 1918; N. H. Jay, Aug. 28th, 1918; S. J. E. Callcott, T. V. Preedy, Sept. 1st, 1918; (Hon. Capt.) D. S. Cumberlege, and to retain his hon. rank, Sept. 2nd, 1918; (Hon. Lt.) E. W. Smyth-Pigott, Sept. 9th, 1918; (Hon. Lt.) H. A. L. Pattison, Sept. 11th, 1918; (Hon. Lt.) H. Beckett, Sept. 25th, 1918; T. R. G. Cooke, Sept. 28th, 1918; A. R. Turner, D. C. Simpson, Sept. 29th, 1918; (Hon. Lt.) F. J. Hansell, Oct. 1st, 1918; (Hon. Lt.) H. L. H. Tate, Oct. 4th, 1918; (Hon. Lt.) C. J. Swatbridge, Oct 5th, 1918; H. Meredith, M. Fletcher, Oct 9th, 1918; E. Fletcher, Oct 11th, 1918; P. R. Ambrose, Oct. 21st, 1918; (Hon. Lt.) J. H. McKellar, Oct. 22nd, 1918; H. M. Smith, J. H. Ball, Oct. 26th, 1918; R. T. Symond, M. C., F. S. Tooley, M.C., Nov. 1st, 1918; A. E. Baxter, Nov. 10th, 1918; R. P. Greey, S. G. Cockburn, J. G. Angus, Nov. 30th, 1918; W. T. Barnes, P. H. Dixon, M.M., Dec. 10th, 1918; H. Haywood, J. R. Williams, Dec. 27th, 1918; F. A. Garwood, H. Laycock, Dec. 27th, 1918; (Hon. Lt.) M. W. Clark, Jan. 1st; G. D. V. Russell, A. B. Fee, Jan. 5th; R. S. Johnston, Jan. 10th; J. T. Thursfield, T. M. Cornish, I. C. Spaven, D. E. Buckland, C. T. Perrins, Feb. 1st; R. M. Campbell J. Erskine, G. S. Daniel, Feb. 2nd; W. E. L. Courtney, Feb. 12th; H. Vanstone, Feb. 25th; S. N. Payne, Feb. 28th; J. McKeogh, C. H. Bates, B. G. Bowen, J. F. Kidd, F. A. D. Vaughan, J. L. Jones, J. Russell, J. J. Birkinshaw, (Hon. Lt.) E. G. Lunn, R. K. Wilson, A. W. Clark, R. L. Paine, L. G. Speck, C. C. S. Preston, A. Miller, W. B. Walker, D.F.C., A. C. Weekes, March 1st; G. H. Clayton, March 2nd; R. C. E. Vernede, March 3rd; H. T. Ayres, March 12th; J. W. Page, March 13th; E. A. Westall, March 17th; A. H. Aitken, March 18th; (Hon. Lt.) G. P. Blake, T. E. Gohl, E. A. Seymour, March 19th; T. H. Forrest, G. L. Rutherford, March 23rd; L. Clark, H. A. Pike, March 25th; W. Allen, A. W. Day, E. P. Hulme, L. G. Bullock, P. B. Spivey, E. P. W. Dyke, J. N. Gladdish, J. W. Patterson, C. Kipling, L. R. G. Langmead, J. Stewart,

A. W. Parr, B. E. Harmer, E. P. Blackmore, H. J. Bristoll, S. Harvey, G. R. Barker, J. N. Ogilvie, March 26th; L. A. Wykes, J. P. Lewis, H. S. Basford, J. Morton, T. W. Sleigh, March 27th; F. R. Keen, March 28th; R. C. Wackett, March 29th, W. S. Spark, March 30th; H. W. Minish, April 1st.

The following relinquish their commns. on ceasing to be empld.:—Lt. E. W. J. Cass (Lt., E. Surr. R.), Feb. 11th; Sec. Lt. (Hon. Lt.) W. S. Ross (Lt., Sco. Rif.), Feb. 15th; Sec Lt. F. V. Preston (Sec. Lt., W. Yorks R., T.F.), March 11th; Lt. P. W. Leycester (Lt. (actg. Capt. R.A.S.C.), March 14th.

The following are transferred to unempld. list:—Lt. H. B. Wood, Jan. 14th; Capt. F. B. Towers, Jan. 28th; Sec Lt. C. G. Ellis, Jan. 29th; Sec. Lt. G. B. Gardiner, Jan. 30th; Lt. E. W. Roberts, Jan. 31st; Lt. A. F. Lingard, Feb. 4th; Lt. J. G. M. Mann, Feb. 5th; Sec. Lt. F. R. Witham, Feb. 8th; Sec. Lt. A. Shepherd, Feb. 9th; Lt. R. A. Wingfield, Lt. H. L. Waite, Feb. 11th; Lt. C. E. Hunter, Capt. E. J. Martin, Feb. 12th; Capt. A. R. Stack, Feb. 14th; Lt. H. C. Benstead, Feb. 15th; Sec. Lt. A. Henderson, Lt. G. W. W. Walpole, Feb. 16th; Sec. Lt. A. F. Wallace, Feb. 17th; Sec. Lt. J. G. Webster, Feb. 26th (substituted for notification in "Gazette," March 20th); Sec. Lt. J. Kelly, Feb. 27th; Sec. Lt. H. Tannenbaume, March 20th; Lt. (Hon. Capt.) W. L. Lister, March 5th; Lt. F. B. Ransford, March 7th; Sec. Lt. A. E. Durling, March 8th; Lt. A. B. Care, March 9th; Lt. D. N. Brampton, M.C. (Middl'x R.) Lt. N. E. Maitland, March 12th; Sec. Lt. W. Hughes, Sec. Lt. C. D. Metcalfe, Sec. Lt. J. T. Phillips, March 13th; Sec. Lt. (Hon. Lt.) H. McF. Crighton, M.C. (R. Scots, T.F.), March 16th; Sec. Lt. H. T. Burt, R.F.A., Sec. Lt. K. S. Laurie, Lt. H. H. Martin, Lt. R. R. Renahan, March 17th; Sec. Lt. B. Green, Sec. Lt. W. Parker, March 18th; Sec. Lt. A. G. Mann, Lt. A. W. Palmer, Lt. A. H. Pownall, March 19th; Lt. C. T. V. Marshall, Sec. Lt. S. J. Saunders, March 20th; Sec. Lt. F. H. Bellinger, Lt. H. P. Maskell, Capt. C. T. Vachell, March 21st; Sec. Lt. (Hon. Lt.) J. C. Batty, Lt. F. H. March (Herts Yeo.), Lt. J. E. Willis, March 22nd; Lt. (actg. Capt.) A. F. Peacey, D.F.C., Lt. N. J. Picken. Lt. A. Wright, March 23rd; Sec. Lt. L. W. Pusey, March 24th; Lt. R. F. Bush, Sec. Lt. H. H. Coulson, Sec. Lt. A. E. Gwyther, Sec. Lt. (Hon. Lt.) D. G. Medas, March 25th; Sec. Lt. W. D. Allan, Sec. Lt. C. H. Booth, Lt. R. H. Dixon, Capt. R. Jarman, D.S.C., Sec. Lt. G. E. Keed, March 26th; Sec. Lt. C. S. Dunbar, Lt. A. Farthing, Sec. Lt. S. Medefski, Lt. (actg. Capt.) G. A. E. Norgarb, Sec. Lt. W. Phillip (King's L'pool R.), March 27th; Sec Lt. J. Fulton, Sec. Lt. R. Miller-Tait, Sec. Lt. F. J. Sutherland, March 28th; Sec Lt. J. T. Dupny, Sec. Lt. T. E. Foster, Lt. H. W. Inwood, Lt. E. F. Jones, March 29th; Sec. Lt. W. A. Deakin, Sec. Lt. C. Dixon, Sec. Lt. H. Elliott, Sec. Lt. W. J. Humphries, Capt. L. R. Wren, March 30th; Lt. A. S. Cross, April 1st, Capt. C. K. Chase, D.S.C., April 2nd; Lt. H. C. Alexander, Sec. Lt. C. W. Duncan, Lt. J. D. Egan, Sec. Lt. L. S. Eckert, Sec Lt. H. E. Gentles, Sec. Lt. R. T. Gummant, April 9th; Lt. H. V. R. Hill, April 10th; Lt. C. J. Fitzgibbon, Sec. Lt. Hon. M. Galletly, Sec. Lt. W. C. Galbraith, Lt. H. W. Halfside, Lt. F. W. Marshall, Lt. B. Martin, Sec. Lt. J. Paterson, Sec. Lt. C. F. Waudby, Sec. Lt. M. Whitehead, April 11th

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—J. H. Acton (contracted on active service), J. F. V. Atkinson (contracted on active service), K. L. Golding, L. H. Phillips (contracted on active service), April 12th

Lt. W. A. Hunter (K.O.Y.L. Inf.) relinquishes his commn. on account of ill-health, April 12th.

Sec. Lt. (Hon. Lt.) H. V. Drew relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain the rank of Lt., April 12th.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—S. Bennett, July 13th, 1918 (substituted for notification in "Gazette," July 12th, 1918); W. H. Tarquhid (contracted on active service), J. H. Hay (contracted on active service), E. A. Homer, W. T. Leonard (contracted on active service), T. Powers, W. L. Vennell, C. Ware (contracted on active service), April 12th.

Sec. Lt. J. N. Holman resigns his commn., April 12th.

The Christian names of Capt. O. A. Westendarp are as now described, and not as stated in "Gazettes," Jan. 17th and March 28th.

The Christian names of Sec. Lt. William George Edwards are as now described, and not as stated in "Gazette." Aug. 6th, 1918

The surname of Lt. H. S. Davidson is as now described, and not Davison, as stated in "Gazette," March 11th.

The initials of Sec. Lt. H. C. Murray are as now described and not as stated in "Gazette," March 18th.

Sec. Lt. W. Woodstack is antedated in his appointment as Sec. Lt. (Observer Officer), May 22nd, 1918.

The notification in "Gazette," March 25th, concerning Lt. S. H. B. Emms is cancelled.

The notification in "Gazette," Jan. 15th, concerning Sec. Lt. A. R. Giroux is cancelled.

The notification in "Gazette," April 1st, concerning Sec Lt. (Hon. Lt.) D. C. Lockwood is cancelled.

The notification in "Gazette," Feb. 14th concerning Lt. G. M. Dean is cancelled.

The notification in "Gazette," Feb. 4th, concerning Lt. A. Buckley is cancelled.

The notification in "Gazette," Feb. 14th, concerning Lt. A. A. Campbell is cancelled.

The notification in "Gazette," March 18th, concerning Sec. Lt. N. C. B. Carrick is cancelled.

The notification in "Gazette," March 18th, concerning Sec. Lt. (Hon Lt.) C. L. Childs is cancelled.

ADMINISTRATIVE BRANCH.—The following are granted temp. commns. as Capts.:—W. L. Blake (Capt., Norf. R.), T. N. Flatt (Capt., Norf. R.), W. J. May (Capt., Camb. R.), April 1st, 1918

Lt. R. J. L. Gerard to be actg. Capt. while empld. as Capt., April 1st, 1918.

The following are granted temp. commns. as Lts.:—F. H. Bushell (Lt., Essex R.), W. H. Peat (Lt., Ches. R.), April 1st, 1918; A. C. Corbetta (temp. Lt., Gen. List), July 1st, 1918, seny. April 1st, 1918.

Lts. (A.) to be Lts.:—(Actg. Capt.) D. H. Robertson, Oct. 30th, 1918, and relinquishes actg. rank of Capt.; C. H. Pownall, Nov. 1st, 1918; R. A. Young, Nov. 6th, 1918; S. H. Wrinch, Dec. 13th, 1918; R. Caldecott, F. W. Doherty, Dec. 16th, 1918; F. W. Mundy, Feb. 3rd; C. J. Stansfield, March 14th.

Lt. E. R. Brown to be Lt., from (K.B.), Jan. 1st.

Lts. (O.) to be Lts.:—J. A. Manners-Smith, Dec. 16th, 1918; F. V. Carpenter, Dec. 18th, 1918; J. W. W. Tregale, Dec. 31st, 1918, D. W. Orr, Jan. 18th; A. W. Rogers, M.M., Feb. 28th; J. Chatterton, M.C., March 4th.

Sec. Lts. to be Lts.:—(Hon. Lt.) (actg. Lt.) T. Hobson, April 2nd, 1918; (Hon. Capt.) (actg. Lt.) H. A. de F. Furber, July 1st, 1918, and to retain his hon. rank; (actg. Lt.) W. H. Nankivell, July 25th, 1918; J. M. Adams, Sept. 1st, 1918; (actg. Lt.) G. E. Tune, Sept. 28th, 1918; (Hon. Lt.) A. R. Barnes, Sept. 30th, 1918; (actg. Lt.) W. H. Botterill, Oct. 5th, 1918; E. F. Robinson, Oct. 26th, 1918; W. Gill, Nov. 8th, 1918; I. M. Moffat, Nov. 27th, 1918; (actg. Lt.) M. Poole-Conner, Nov. 30th, 1918; A. E. Peel, Dec. 21st, 1918; W. Hopps, Dec. 22nd, 1918; H. E. Gridley, Feb. 5th; F. E. Shersby, Feb. 16th; C. Lyons, March 8th; L. Singer, March 16th.

Sec. Lts. to be Sec. Lts., from (A.):—H. C. Mitchell, Jan. 3rd; A. E. Overton, Jan. 8th, and to be Hon. Lt.; R. J. Tomson, Jan. 9th; R. Logan, March 19th; W. V. Ryan, March 21st.

Sec. Lts. to be Sec. Lts., from (A. and S.):—G. J. E. Boyd, Jan. 5th; K. M. Mulrihill, March 1st; C. E. Watson, March 21st.

Sec. Lts. to be Sec. Lts., from (O.):—L. Eteson, Nov. 25th, 1918; S. R. Payne, Nov. 29th, 1918; A. Taylor, Dec. 10th, 1918; S. A. Barnes, Jan. 6th; F. H. Sibley, Jan. 20th, and to be Hon. Lt.; W. I. E. Lane, M.C., Jan. 24th; D. F. Harrison, Feb. 9th; H. Ricketts, Feb. 13th; B. Hurdus, G. E. Rochester, E. A. Seal, March 18th; M. C. Sexton, March 26th, and to be Hon. Lt.; Sec. Lt. J. H. Drayton (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt., March 21st.

The following relinquish their commns. on ceasing to be empld.:—Lt. A. G. Heap (Lt., L'pool R.), Nov. 3rd, 1918; Sec. Lt. F. A. Pritchard (Sec. Lt., Ches. D.), March 17th.

The following are transferred to unempld. list:—Sec. Lt. C. Ward, Feb. 5th; Lt. C. W. T. Riley, Feb. 11th; Sec. Lt. W. R. Watt, Feb. 16th; Sec. Lt. F. W. Weeks, Feb. 22nd; Lt. (Hon. Capt.) G. T. Addis (R. Dub. Fus.); Lt. R. C. Allen (N. Mid. Brig., R.F.A., T.F.), Lt. L. G. Kesterton, Feb. 23rd; Lt. M. H Unwin, Feb. 27th (substituted for notification in "Gazette," March 14th); Sec. Lt. R. A. Smith, Feb. 28th; Sec. Lt. H. B. Elbourne, March 1st; Sec. Lt. (Hon. Capt.) R. N. Thomas, March 4th; Lt. (Hon. Capt.) D. W. Harper, March 8th; Maj. (actg. Lt.-Col.) R. M. Daniel, March 15th (substituted for notification in "Gazette," March 28th); Sec. Lt. D. T. Paine, March 18th; Sec. Lt. H. G. G. Rawlings, March 20th; Sec. Lt. (actg. Capt.) W. F. Dean, Sec. Lt. L. J. Simmons, March 21st; Capt. W. O. Thomas, M.C., March 23rd; Lt. (actg. Capt.) F. B. Luget, Lt. (actg. Capt.) W. G. Nutten, March 27th; Lt. I. A. Laing, March 29th.

The following Lts. (actg. Capts.) relinquish their commns. on account of ill health contracted on active service, and are permitted to retain the rank of Capt.:—S. I. Chapman, (Hon. Capt.) C. W. Wright, April 12th.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—J. R. Hett, R.F.A., W. H. Glaser, H. I. Turner (contracted on active service), April 12th.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—G. Elliott (caused by wounds), E. Holt, April 12th.

The date of appointment of Lt. E. S. C. Brooks as actg. Capt. is Feb. 1st, and not as stated on page 3,021 of "Gazette," March 4th.

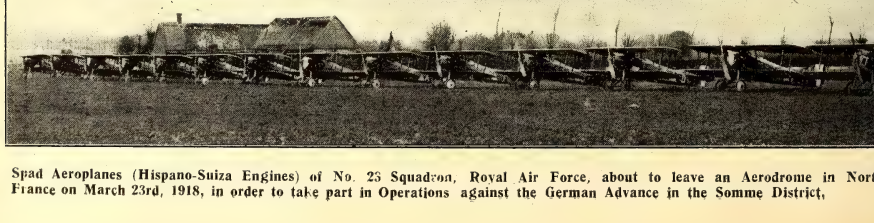
The surname of R. S. Maitland-Edwards is as now described, and not as stated in "Gazette," March 7th.

The notification in "Gazette," March 7th, concerning Lt. D. H. Robinson, A.F.C., is cancelled.

TECHNICAL BRANCH.—Lt. B. H. McLeod to be Lt. Grade (A.), from (A.), July 16th, 1918.

Sec. Lts. to be Lts.:—(Hon. Lt.) (actg. Lt.) E. A. Gulson, (Hon. Lt.) (actg. Capt.) H. C. Bishop and to retain his actg. rank, April 2nd, 1918; (actg. Lt.) R. G. Shackell, April 13th, 1918; (actg. Lt.) E. W. Brooks, June 8th; (actg. Lt.) S. Beeby, Aug. 12th, 1918; (actg. Lt.) J. S. Done, Sept. 14th, 1918; (actg. Capt.) L. A. Hooper, Oct. 8th, 1918, and to retain his actg. rank; (actg. Lt.) J. D. Fairbairn, Oct. 27th, 1918; (actg. Lt.) C. W. B. Tubbs, Dec. 1st, 1918; (actg. Maj.) R. B. Stephenson, Dec. 18th, 1918, and to retain his actg. rank; (actg. Capt.) C. G. Stevens, Jan. 10th, and to retain his actg. rank; (actg. Capt.) C. H. Quelch, Jan. 29th, and to retain his actg. rank; (actg. Lt.) J. F. Clark, Jan. 31st.

Sec. Lts. to be Lts., without pay and allowances of that rank:—(Hon. Lt.) J. Lundon, (Hon. Lt.) E. W. Hallam, (Hon. Capt.) H. Gardiner, and to retain his hon. rank, N. N. Corbishley, (Hon. Capt.) G. M. Nobbs, and to retain his hon. rank, (Hon. Lt.) A. W. Furbank, E. P. Proud, (Hon. Lt.) R. F. Tindall, G. W. G. Tucker, (Hon. Lt.) M. A. Shepstone, N. Pellew, (Hon. Lt.) J. W. Bradford, April 2nd, 1918; S. G. Elliot-Smith, April 14th, 1918; (Hon. Capt.) E. H. Walter, and to retain his hon. rank, (Hon Lt.) B. Hesketh, April 23rd, 1918; A. R. Butler, May 4th, 1918; (Hon. Lt.) J. E. Sierra, J. Groves, F. M. Thomas, May 5th, 1918; F. B. Palmer, M.C., May 13th, 1918; (Hon. Lt.) J. T. M. Hill, June 16th, 1918; (Hon Lt.) C. H. Habrow, June 18th, 1918; (Hon. Lt.) H. B. Lee, M.C. July 26th, 1918; A. McCulloch, Aug. 9th, 1918; L. McLauchlan, Aug. 10th, 1918; J. S. V. Stephen, Aug. 13th, 1918; J. K. Shrimpton, Aug. 19th, 1918; W. F. Thrutchley, Sept. 14th, 1918; F. H. Alder, Sept. 12th, 1918; E. A. Moran-Smith, Sept. 14th, 1918; H. W. Sharman, Oct. 20th, 1918; (Hon. Lt.) H. J. Dixon, Nov. 9th, 1918, P. E. Towler, Nov. 24th, 1918; E. R Blount, R. U. Nash-Taylor, Dec. 1st, 1918; T. Willis, December 30th, 1918; (Hon. Lt.) E. J. Leech, Jan. 1st; R. E. H. Heenan, Jan. 10th; J. S. Suckling,



Spad Aeroplanes (Hispano-Suiza Engines) of No. 23 Squadron, Royal Air Force, about to leave an Aerodrome in Northern France on March 23rd, 1918, in order to take part in Operations against the German Advance in the Somme District.

Jan. 19th; C. H. Chadwick, J. C. Shakeshaft, Jan. 31st; V. H. C. Gayford, Feb. 7th; E. Harrison, Feb. 12th; C. G. Fosier, Feb. 21st; R. T. B. Wynn, C. W. Triggs, G. Glen, W. H. Short, Feb. 24th; M. G. Fountain, Feb. 28th; G. R. Hanson, W. C. Farley, March 1st; W. E. French, March 2nd; W. H. Fearnsides, March 5th; F. S. Stokes, A. Campbell, A. Jennings, F. T. Holmes, F. O. Brownson, March 8th; A. Ledger, March 10th; H. A. Creswell, March 18th; J. G. Tennant, March 20th; C. J. Ashdown, F. G. Rison, March 21st; F. L. Barnett, S. G. Newport, H. S. C. Cann, D. H. Fenner, J. H. Hunter, C. F. Lane, J. W. Power, March 24th.

Sec. Lt. L. Warille-Donald to be Lt. from (Ad.), Aug. 9th, 1918 (substituted for notification in "Gazette," Aug. 10th, 1918).

Sec. Lt. G. A. F. Gibson to be Sec. Lt. Grade "A" from (Ad.), Dec 2nd, 1918.

Lt. A. J. Dale (R.N.) relinquishes his commn. on ceasing to be employed, March 22nd.

The following are transferred to unemployed list:—Sec. Lt. R. J. Hibberd, Jan. 4th; Capt. H. A. Wilsdon, Jan 21st; Sec. Lt. W. C. Burleigh, Jan. 23rd, Sec. Lt. L. J. Cooke, Feb 3rd; Lt. S. H. Pestell, Feb. 27th; Lt. (actg. Capt.) L. G. Mace, March 1st; Lt. H. S. Downs, March 5th (substituted for notification in "Gazette" of Feb. 28th); Lt. B. Pool, March 11th; Sec. Lt. R. S. A. Noakes, March 13th; Lt. (actg. Capt.) J. G. Connell (R.F.A., T.F.), Lt. F. Mayer, March 14th; Sec. Lt. M. J. S. Paton, March 17th; Lt. J. W. Maddock, Capt. W. Stewart, March 19th; Lt. (actg. Capt.) S. M. Campbell (Sco. Rif., T.F.), March 20th; Sec. Lt. (actg. Capt.) J. M. Pinkerton, March 21st; Lt. W. S. Renwick, Lt. M. E. Staples, March 22nd; Capt. J. W. Morley, March 24th; Sec. Lt. (Hon. Lt.) H. D. Cape, Lt. E. C. Colman (Wilt. R.), Capt. C. W. Jamieson, March 27th; Lt. F. H. Holmes, M.C. (R.E., T.F.), Sec. Lt. W. H. Hitch, Capt. J. Lanning, Lt. (actg. Maj.) W. E. Phillips, March 28th; Lt. H. C. Sharp, March 30th; Sec. Lt. (actg. Lt.) H. T. Hamblin, Lt. E. F. Huntley, Lt. W. A. Stevwright, Lt. (Hon. Capt.) (actg. Capt.) T. N. Weguitin, March 31st; Capt. A. D. Allen, Sec. Lt. D. L. Kane, April 1st; Lt. (actg. Capt.) E. S. Crabtree, April 3rd.

Sec. Lt. P. O. Patterson relinquishes his commn. on account of ill-health, and is permitted to retain his rank, April 12th.

The initial of H. Cox is as now described, and not E., as stated in "Gazette" of April 4th.

The notification in "Gazette" of March 18th concerning Lt. F. A. Roberts is cancelled.

The notification in "Gazette," April 1st, concerning Sec. Lt. H. Linfield is cancelled.

Medical Branch.—Capt. J. S. Dockrill (R.A.M.C.) is granted a temp. commn. as Capt., Oct. 1st, 1918, with seny., from April 1st, 1918.

N. S. Gilchrist, G.B.E. (T./Capt., R.A.M.C.), is granted a temp. commn. as Capt., Oct. 1st, 1918, with seny., from April 1st, 1918.

Lt. Col. W. H. Pope (R.N.) relinquishes his commn. on ceasing to be empld., April 1st.

The following are transferred to unempld. list:—Capt. A. B. Lindsay, Feb. 24th; Capt. C. L. Birmingham, M.D., March 1st; Capt. C. W. W. James, March 4th; Capt. C. F. Hereford, March 18th.

The notification in "Gazette" of April 1st concerning Capt. R. W. Jones is cancelled.

Dental Branch.—Sec. Lt. D. Campbell is transferred to unempld. list, March 28th.

Memoranda.—Sec. Lt. (Hon. Lt.) R. W. Monro is granted the hon. rank of Capt., June 7th, 1918.

Sec. Lt. W. G. Edwards to take rank and precedence as if his appt. as Sec Lt bore date, 24th

Temp. Hon. Lt. R. H. Harnett relinquishes his commn. on ceasing to be empld., March 1st.

The following are transferred to unempld. list from (S.O.):—Lt. (actg. Capt.) E. A. Mayner, March 31st; Lt (actg. Capt.) H. H. Harries, April 1st.

FROM THE COURT CIRCULAR.

Buckingham Palace, April 9th

The Right Hon. Winston Spencer-Churchill, M.P. (Secretary of State for War and Air) and the Right Hon. Sir Rennell Rodd (His Majesty's Ambassador Extraordinary and Plenipotentiary at Rome) had audiences of the King this morning, and Sir Allan Smith had the honour of being received by His Majesty.

The Prince of Wales and the Prince Albert, attended by Captain the Lord Claud John Hamilton and Major Louis Greig, were present at the Association Football Match between the Army (London Command) and the Royal Air Force (South-Eastern Area), at Stamford Bridge this afternoon.

Buckingham Palace, April 10th.

The following were severally introduced into the presence of the King, when His Majesty invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:—

The Most Excellent Order of the British Empire.—Officers (Military Division).—Maj. Harry Walmsley, R.A.F.

Members (Military Division).—Capt. Dudley Upjohn, R.A.F.

The King then conferred decorations as follows:—

Bar to the Military Cross.—Maj. Roy Phillipps, Aust. F.C.

The Military Cross.—Lt.-Col. Barry Martyn, R.A.F.

His Majesty inspected a party of Indian non-commissioned officers and men belonging to Divisional Ammunition Columns, Royal Artillery, and the Royal Air Force Base Depot, under the command of Capt. H. C. Clogstoun (Labour Corps), who are on short leave from France.

Buckingham Palace, April 12th.

The following were severally introduced into the presence of the King, when His Majesty invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:—

The Most Distinguished Order of Saint Michael and St. George.—*Companion.*—Brig.-Gen. Bertram Fellows, R.A.F.

The Most Excellent Order of the British Empire (Military Division).—Commander.—Lt.-Col. Thomas Cave-Browne-Cave, R.A.F.

The Most Excellent Order of the British Empire (Military Division).—Officers.—Mrs. Margaret Moss, W.R.A.F.; Lt.-Col. Ernest Stedman, R.A.F.; Maj. Frank Jolly, R.A.F.; Maj. Reginald Maitland, R.A.F.; and Maj. Brefney O'Reilly, R.A.F.

The King then conferred decorations as follows:—

The Military Cross and Bar.—Capt. Ronald Mark, R.A.F.

The Military Cross.—Major Angus Bell-Irving, R.A.F.; Capt. John Chick, R.A.F.; Capt. Leslie Mann, R.A.F.; Capt. Walter Park, R.A.F.; Lieut. Leslie Hird, late R.A.F.

ADMIRALTY APPOINTMENTS.

The following appointments have been made:—

April 8th.—Lieut. C. C. Dickinson, D.S.O., to "Pegasus," March 27th.

Sub-Lt. G. V. Knight, to "Pegasus," April 4th.

Mate, G. D. Neate, to "Pegasus," April 4th

April 11th.—Actg. Mate.—H. F. Hackett to "Argus," April 10th.

April 14th.—Ch. Gunner (T.).—T. F. Britton, D.S.C., for duty with the Royal Air Force, April 28th.

WAR OFFICE COMMUNIQUE.

The G.O.C. British Forces in Russia reports on April 10th:—

The defence of Bolshezerki (on the Vologda railway) against the attacks on April 1st was carried out by the Russian National Army, of which only the artillery had some French officers.

The R.A.F. rendered great assistance under great difficulties owing to bad landing grounds. Among the pilots and observers were Canadians, South Africans, and Russians.

THE CASUALTY LIST.

NAVAL.

Reported April 15th.

The undermentioned officers previously reported missing on the dates set against their names, now officially presumed killed on those dates.—Flt. Sub-Lt. John G. Carrol, R.N., March 28th, 1918.

Flt. Sub-Lt. Lionel B. Ransford, R.N., March 18th, 1918.

Flt. Sub-Lt. Edward C. Stocker, R.N., March 27th, 1918.

MILITARY.

Reported April 10th.

Previously reported Missing, now reported Killed.—Reading, Sec. Lt. V. J., R.F.C.

AIR FORCE.

Reported April 10th.

Killed.—Siennett, Lt. W. R.

Wilson, Lt. H. B.

Died of Injuries.—Glanville, Capt. H. F.

Died.—Delaney, Capt. M.

Hutchison, Sec. Lt. H.

Russell, Capt. C. E. S.

Wounded.—Buxton, Maj. V.; Eastwood, Sec Lt D. D. M.; Redmond, Sec. Lt. W. D.

Missing.—Nunan, Sec. Lt. N. D.; Tattam, Sec. Lt. F. F.

Repatriated.—Branford, Capt. F. V.; Jenks, Lt. J. C. A.; Kinmond, Lt. D. C.

Casualties among Airmen. The dates are those of the Official List.

Died of Injuries.

April 8th.—McEvoy 55219 AC/1 F. (Artana, Dromara, Co. Down).

Died.

April 8th.—Biscoe 7443 L/AC (a/Cpl.) F. A. (East Sheen); Buckley 29541 L/AC (a/Cpl.) G. (Oldham); Challenor 248333 AC/2 E. O. (Middlesboro'); Cope 5977 Sjt. F. E. (Caerphilly), Cushen 134009 AC/2 W. (Richmond); Deeley 88138 Sit.-Majr./1st A. (Bromley); Davies 22896 AC/1 E. B. (Llandinam); Day 84916 AC/1 T. E. (Kennington); Gregory 2897 Cpl T. H. (Taffits Wells); Haig 96148 AC/2 J. (Barnsley); Kemp 111826 AC/1 W. R. (Victoria Park, E.9); Krall 52276 L/AC K. (Kensington); Leeson 188678 AC/2 C. (London); Tollicott 402295 L/AC G. W. (London); Raeburn 280015 AC/2 G. (Glasgow); Spence 102071 AC/2 H. (Salford); Thompson 206375 L/AC J. E. (Leeds); Watts 213665 AC/1 P. H. (Harrow Weald); Wragg 67787 AC/2 A. (Malpas).

PERSONAL NOTICES.

NAVAL.

Marriage.

STEPHENS—FINN.—The marriage of Captain M. H. Stephens, R.A.F. (late R.N.A.S.), youngest son of Mr. J. Stephens, Toronto, Canada, and Marjorie, younger daughter of the late Mr. Alexander Finn, late H.B.M. Consul-General for Chile, and Mrs. Finn, of 2, Pack Road, Richmond, Surrey, will take place very quietly, owing to mourning, at St. Matthias's Church, Richmond Hill, on Saturday, April 26th, at 2.15 p.m. All friends will be welcome at the church.

* * *

Lieut. Frank Titchener, R.A.F. (formerly of the R.N.A.S.), of the 202nd Squadron, France, was last seen on May 11th, 1918, flying No. A.7768 between Ostend and Zeebrugge. Will repatriated officers and men (or those flying with him at the time) who can give any information write to his mother—Mrs. Titchener, 178, Church Road, Teddington?

MILITARY.

Engagements.

GEMSON—DE VIRY.—A marriage is arranged, and will shortly take place, between L. C. G. Gemson, late R.E. and R.A.F., of Southport and London, and Mlle. Marie de Viry, Commandant, Red Cross Hospital, Marquise, Pas-de-Calais, second daughter of the late Comte de Viry, of Bazeilles, Ardennes.

LANCASTER—PIARY.—The engagement is announced between Lieut. J. H. Lancaster, Aust. F.C., of 127, Fellows Road, Hampstead, and Miss Lily Piary, of 26, Faure Street, Cape Town.

PERRIN—GRAZEBROOK.—The engagement is announced of Captain (acting Major) Eugene Courtenay Perrin, O.B.E., 4th Battalion the Cheshire Regt. and R.A.F., elder son of Mr. and Mrs. J. E. Perrin. The Paddock, Hoylake, and Katharine Arthur Mary Violet, widow of Captain Charles Grazebrook, King's Royal Rifle Corps, and daughter of the late Arthur Hickman and of Mrs. Morgans, Little Meadow, Radlett.

Marriages.

RAYNER—WOOD.—On April 8th, at the Parish Church, Whitchurch, Bucks, Capt. A. H. Rayner, late R.F.C., youngest son of Mr. G. G. Rayner, Croydon, was married to Mary Joyce,

R.A.F., only daughter of the Rev. Hugh and Mrs. Wood, of Whitchurch, by the Rev. F. Northrop, S.C.F., and assisted by the Rev. H. B. Walton, Rector, of Hardwick.

TURNER-BRIDGER—NURSE.—The marriage arranged between Major Fernley Turner-Bridger, The Black Watch (Royal Highlanders) and R.A.F., son of Mr. and Mrs. Turner-Bridger, Anne Cott, Haslemere, Surrey, and Dorothy Alice, daughter of Mr. and Mrs. T. Johnson Nurse, Ashdene, March, Cambs., took place quietly at St. Peter's, Eaton Square, on April 19th.

* * *

The late Capt. Bentfield Charles Hucks, R.A.F. (formerly R.F.C.), of Piccadilly, W., who died from pneumonia, at the age of 34 years, left an estate to the value of £9,236.

AIR FORCE.

Engagements.

BEDDOW—HOLMES SCOTT.—A marriage has been arranged, and will take place very shortly in London, between Capt. L. T. Beddow, R.A.F., of Thorverton, near Exeter, and Doris Holmes Scott, Deputy Administrator, W.R.A.F., widow of Capt. A. Holmes Scott, M.C., R.E., and only daughter of the late J. S. Clayton, V.D., M.D., F.R.C.S.Edin., and Mrs. Clayton, 97, Vicarage Road, Eastbourne.

SNOW—COLWELL.—An engagement is announced between Capt. C. C. Snow, R.A.F., and Gladys Burton, eldest daughter of the late General Colwell, C.B., Royal Marines, and Mrs. Colwell, Claremont Lodge, Southsea.

Marriages.

NASH—NORMAN.—On March 15th, at St. Paul's Church, Rondebosch, Cape Town, Capt. Eugene Fleetwood Nash, R.A.F., youngest son of Edward Henry Nash, of Gerrard's Cross, Bucks, was married to Winifred Norman, granddaughter of David Francis, Esq., of Tati House, Frognal, Hampstead.

READMAN—THWAITE.—On April 4th, in London, Cyril Hamilton Blyth Readman, R.A.F., second son of Dr. and Mrs. J. B. Readman, Belmont, Hereford, was married to Eleanor, the only daughter of Mrs. Thwaite (and the late Mr. Newsome Thwaite), 2, Harley House, Regent's Park, W.

Births.

BOUMPHREY.—On April 10th, 1919, at "Fairview," Coleman's Estate, Prittlewell, Essex, to Esther (née Grandage), wife of Capt. G. M. Boumphrey, R.A.F.—a son.

DEES.—On April 8th, at Oakley House, St. Peter's Street, Winchester, to Ruby, wife of Capt. Adrian Dees, R.A.F.—a son.

RILEY.—On April 13th, 1919, at Park Lodge Nursing Home, Brockley, London, to Dora (née Witney), wife of Captain C. Gordon Riley, R.A.F.—a son.

* * *

Lieut. P. M. Dennett, R.A.F., of the 208th Squadron, has been missing since June 2nd, 1918. Will any officer knowing the latest particulars of Mr. Dennett please communicate with E. C. Goodman, Mount Pleasant, Hastings?

The Royal Naval, Military, and Air Force Tournament.

The Royal Naval, Military, and Air Force Tournament will be held at Olympia from June 28th to July 12th. It is five years since the tournament last took place. A feature this year is the extension of the title to include the Royal Air Force as a third service of a military character.

Athletics in the R.A.F.

On Wednesday, April 9th, the R.A.F. Association Football Team met the London Command Eleven at Stamford Bridge. This was the third meeting of the two teams, the two previous matches having both resulted in a draw.

H.R.H. the Prince of Wales, K.G., and Capt. the Prince Albert, K.G., R.A.F., were both spectators at the match. On the whole, the R.A.F. were the better team, and deserved their win of one goal to nil.

By their win over the Canadian Fifteen at Leicester by one goal and two tries to one try, the R.A.F. gained their second victory in the Services Rugby Football Competition. They finish level with South Africa, and, therefore, considering that they began the Competition with three defeats, have some cause for satisfaction.

Aeroplanes for Archangel.

It has been stated that an ice-breaker, laden with aeroplanes, is attempting to reach Archangel but is at present held fast.

Mr. Churchill has so far refrained from making any reference to "Fighting Archangels."

What the American Air Service Offers.

The following appears in the D.M.A. "Weekly News Letter," published at Washington by the War Department It is of considerable interest as it indicates the future policy of the United States with regard to the Air Service :—

The Army Air Service presents many interesting advantages to the enlisted man. It offers a good situation now; it educates its members thoroughly in the new and growing science of aviation, with its many commercial features, and offers to those enlisted men who are physically and mentally equipped an opportunity to learn to fly. Incidentally this service pays good salaries and provides for early promotion.

In accordance with the plans of the Government for the organisation of a permanent Air Service, the Director of Air Service has been authorised by the General Staff to re-enlist or recruit enlisted men up to 15,000.

Have you a good job to-day? If not, what can you find better than the Air Service?

One feature of service in the military branch of aviation not usually considered is the education in aviation to be gained. There is but little, if any, opportunity to-day to secure employment with any of the large manufacturers of aircraft; they are cutting down their personnel. The commercial future of aviation in this country, while most promising, is at present hanging fire at best, and every plant has more experienced men than it can keep employed. The Air Service will take you to-day, however, and teach you practical aviation. The time will come within a year or two when there will be a great demand for skilled mechanicians and other experts in aviation who have had experience. To-day the only practical way to get experience is in the Air Service. Then the opportunities for good positions in commercial lines may be seized when they appear.

It is possible for men now in the Air Service to get their discharges with the $60.00 bonus and re-enlist in the Air Service for a year, with the privilege of a month's furlough. In most cases it will be possible for the non-commissioned personnel to retain the grade held during the war, and upon re-enlistment be allowed five cents per mile en route home.

The chances of advancement in the Air Service are excellent. A bright, energetic young man with initiative should not remain a private long. A man is promoted to the grade of non-commissioned officer for aptitude, attentiveness, willingness, and ability. The following table shows the chances of promotion in a squadron of 150 men, or rather it shows 114 non-commissioned grades of corporal, or better, that are available, and to which men enlisting in the Air Service can be promoted. Only 36 of the 150 are privates.

Four master signal electricians, 29 sergeants (first class), 33 sergeants, 48 corporals, 12 privates (first class), and 24 privates.

With respect to the various activities that are carried on in the Air Service, 17 different types of tradesmen are required for as many sorts of work :—

Radio mechanical work, wireless telegraph and telephone, radio electricians, airplane mechanics, aero motor mechanics, propeller makers, fabric workers, magneto repair men, instrument repair men, carpenters and cabinet makers, machinists and tool makers, metal workers and welders, coppersmiths and vulcanisers, photographers, draughtsmen, bench mechanics, and chauffeurs.

Almost any type of work in which a man is interested is required in the classifications that make up the personnel of the Air Service. Whatever may be a recruit's desires, there is no reason why those desires cannot be fulfilled by an enlistment in the Air Service.

Little mention has been made of the chances that an enlisted man has to learn to fly, but instructions have already been issued to the flying fields covering conditions under which enlisted men may learn to fly. The main qualifications determining whether or not an enlisted man will be taught how to fly are physical qualifications, combined with the necessary mechanical knowledge which he must have before he will be allowed to participate in flights or will be allowed to receive instruction in a machine. The average enlisted man with a high school education who has applied himself so that he has a good knowledge of motors and airplanes, and is in such condition physically that he can pass the required examination, can learn to fly. After a man learns to fly, he will, if properly qualified from an educational viewpoint, be given a good opportunity to secure a commission in the Air Service. Regulations are now being compiled covering this phase of the service.

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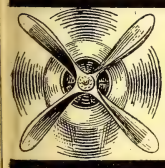
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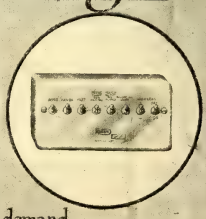
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ON THE TRADITIONS OF THE R.A.F. (I)

In his farewell dispatch, on returning to England and leaving the Command of the British Army which he had directed to victory, Field-Marshal Sir Douglas Haig made a reference to the R.F.C. and R.A.F. which is typical of that loyalty to those under him which has won for him so much good and faithful service.

The reference reads thus :—

> I recall with gratitude the magnificent work done during the fighting of 1916 and 1917 by Major-General Sir H. M. Trenchard, at that time commanding the Royal Flying Corps. The influence exerted by this able and distinguished officer upon the moral and the development of the British Air Service and in the creation of its splendid traditions can scarcely be exaggerated.
>
> Since his transfer to another but kindred field of activity, his work has been most ably and successfully carried on by Major-General Sir J. M. Salmond, commander of the Royal Air Force on the Western front.

The Ideal Air Force.

Some people seem to have the idea that because one has on occasion said some extremely rude things about the Royal Air Force one is therefore opposed to everybody and everything concerned with the R.A.F. It is true that for purely military reasons one would prefer to see the R.N.A.S. re-established as a part of the Navy and the R.F.C. as a part of the Army, with the Royal Air Force as a separate Service for purely aerial operations. In this one has the support of a number of the most far-seeing and most experienced people in both the senior Services. But whether the R.A.F. is to be established on such a basis or whether it is to be the only Flying Service and is to supply aerial units for the two senior Services in time of war, one's first and foremost desire is that the R.A.F. shall be the smartest and most efficient of the King's Services.

Last week one quoted a phrase produced fairly recently to the effect that "The ideal of the Royal Air Force should be to be as smart as the Guards and as handy as the Navy," and it is owing to an intense desire that this ideal shall be attained that one is compelled from time to time to expose the abuses which exist in the R.A.F., the lamentable mis-organisation and disorganisation of the Air Force, its low level of discipline, and its general unworthiness to be considered the equal of the senior Services.

The Beginning of the R.F.C.

When the Royal Flying Corps first came into being it combined in its small personnel the virtues of every branch of the Army. The organisation was in the hands of Major F. H. Sykes, an officer of one of the smartest cavalry regiments, who had held various important staff appointments. His scheme of organisation in squadrons and flights holds to this day and has proved quite admirable under the test of war.

The officer commanding the first aeroplane unit, known as No. 1 Aeroplane Section, The Air Battalion, R.E., was Captain J. D. B. Fulton, an artillery officer of high accomplishments—as was proved by the fact that his inventions for the improvement of artillery brought such reward from the War Office that he was enabled to buy a Blériot monoplane and fly it out of the proceeds. Besides being a very able mechanical engineer, he was a sportsman of the finest type and in every way the ideal officer and gentleman.

With him were other officers of a similar type—the late Captain Loraine, Scots Guards, Lieutenants Connor and Hynes of the Artillery, and one or two others.

When the R.F.C. grew from this one Aeroplane Section, there came into it infantry officers who brought in the sound traditions of the Infantry of the Line. Officers such as Captain Brooke-Popham, Captain Dawes, Captain Webb-Bowen, Captain Becke, Captain Salmond, Lieutenants Longcroft, Sheppard, Cholmondeley, and others, some of whom are dead and many of whom happily hold high rank in the R.A.F., brought into the young R.F.C. the finest traditions of the Army.

The first Adjutant was Lieutenant Barrington-Kennett, Coldstream Guards, who brought with him for the proper education of the rank and file of the R.F.C. a number of "Guardee" N.C.Os.—Serjeant-Instructors and so forth of the most efficient type—and these experienced Guardsmen set to work on a heterogeneous mass of undisciplined civilian mechanics with such good effect that within twelve months the R.F.C. on parade was as smart a unit as any equal number of men from the Brigade of Guards.

True Co-operation.

This was accomplished without in any way decreasing the efficiency of the men as mechanics. In the nature of things the officers of the R.F.C. and their men were brought into very close contact, for the officers naturally took a very keen personal interest in the state in which their machines and engines were maintained, and there were few officers who did not actually work on their machines alongside their mechanics. Thus the officers and men came to know one another as intimately as do the officers and men of a submarine.

Yet this familiarity did not in any way breed contempt. Rather it increased the respect of the men for their officers, for the civilian mechanic, who came into the R.F.C. full of the astonishing ignorance of his class and its common prejudice against the British officer whom he had seen described in the daily news-sheets by Labour Leaders of the nature of Mr. John Burns and Mr. Lloyd George as "a gilded popinjay," found that the educated gentleman of the King's Army was very often a better mechanic than he himself, and, thanks

to his better education, was able to teach him things about his own job.

The Trenchard Touch.

A little later on when the Central Flying School was formed and Captain Godfrey Paine, R.N., was made Commandant, the first Assistant-Commandant and Chief of Staff was Lieut.-Col. Cooke, an artillery officer of great ability, and when he returned to the artillery after a year or so, he was succeeded by Major Hugh Trenchard of the Royal Scots. He, having served for years in West Africa and having learnt that the way to handle niggers is to treat them with the same kindness and firmness as that which is necessary to the proper upbringing of children, applied the same methods to the children of all classes who came to the Central Flying School.

The success of his methods is too well known to need any discussion, and the success of the same methods on an enormously extended scale on active service resulted in the R.F.C. achieving that Command of the Air which so many important people used to tell us was an impossibility.

The Meaning of Tradition.

The smartness of the Guards was given to the rank and file by the Barrington-Kennett tradition as one has already stated. And for the benefit of the younger generation of the Royal Air Force, one desires to put on record the fact that Major Barrington-Kennett, having done so much good work for the R.F.C., deliberately put aside the certainty of promotion to the rank of general officer so that in time of great stress in 1916 he might go back to his own Brigade of Guards as a Major, and there he died gallantly at the head of his men. His life and death should be a lesson to those in the Royal Air Force who set their personal advancement before their duty to their King.

The Fulton tradition of friendly co-operation between officers and men in the workships produced that versatility and mechanical effectiveness which enabled the R.F.C. in the field to do the Army's air work despite intrigue and inefficiency among the technical people at home. It was seen at its very best during the great German advance in March 1918, when, in spite of every possible hindrance, losses in the workshops, losses of material, and the worst possible weather conditions, the air-mechanics of the R.F.C. kept their machines in the air and enabled the R.F.C. to play a most important part in saving the British Army during its retreat.

The Trenchard tradition, begun at the Central Flying School and built up to its fullest development in the field, gave the youthful pilots of the R.F.C. that wonderful spirit of self-sacrifice and high standard of discipline in the field which made the R.F.C., at the moment when it ceased to exist, the greatest flying service in the world.

Those are the traditions of the Royal Flying Corps, and it should be the ideal of the Royal Air Force to live up to those traditions. What they have meant to the British Army in the war is indicated by the quotation from Field-Marshal Sir Douglas Haig's dispatch which appears at the head of this article.

The R.N.A.S. Way.

The Royal Naval Air Service has, in its own quaint way, contributed other traditions worthy to be followed by the Royal Air Force. The R.N.A.S. has never been remarkable for its high standard of discipline. Nevertheless at certain Stations a spirit of enthusiasm was instilled into the personnel which produced wonderful results.

One recalls Eastchurch in its early days when Lieutenants Samson, Gregory, and Longmore, R.N., and Lieutenant Gerrard, R.M.L.I., constituted the entire officer personnel of Naval aviation. The men attached to the aerodrome worked with enthusiasm for aviation and with sincere regard for their officers. A little later Lieutenants Malone, Spenser Grey, and Parke, Engineer-Lieut. Featherstone Briggs, Assistant-Paymasters Byrne and Parker, R.N., Lieutenant Lushington, R.M.A., and Lieutenant Risk, R.M.L.I., the tradition of enthusiasm and hard work was continued.

At a later date one recalls the Felixstowe Station, commanded by a Marine officer and equipped with Farman seaplanes, when the smartness of the Station in every respect was worthy of a Royal yacht. Later again, in the early days of the war, one remembers Hendon and Chingford as R.N.A.S. aerodromes at which an energetic "Number One" insisted on everything being done "at the double," and woe betide anybody, from a Flight Sub-Lieut. downwards, who was ever seen to walk when on duty.

A War Tradition.

One recalls that on active service the first bomb raids into Germany were made by R.N.A.S. units on Düsseldorf, Cologne, and Friedrichshafen. And later, when bombing was still regarded as of no war-like value, the R.N.A.S. acquired undying merit by developing the big bombing machine and organising bombing raids which were run with machine-like regularity and accuracy.

Also it is to the credit of the Air Department of the Admiralty under Captain Murray Sueter, R.N., that when the R.F.C. Authorities at home were endeavouring to foist upon the people in the field ineffective aeroplanes and engines of Government design the R.N.A.S. procured the best aeroplanes and engines in the world from the British Aircraft Industry. Moreover, these aircraft were obtained in such quantities that when the R.F.C. —despite the efforts of the people in the field—found themselves at the mercy of the German Air Service, the R.N.A.S. was able to supply the R.F.C. with aeroplanes which entirely turned the tables on the enemy.

Again, when the R.F.C. found itself hard pressed, the R.N.A.S. was able to supply certain fighting squadrons under very gallant and skilful leaders which had much the same effect on the German Air Service as at times the famous German "Circuses" had on the R.F.C.

Thus, the R.A.F. inherits from the R.N.A.S. the tradition of energy, initiative, and a fine offensive spirit which, when combined with the traditions of the R.F.C., should make it the greatest of all the King's Services.

It is because one's most earnest desire in life is to see the new R.A.F. become worthy of these high traditions that one criticises as bitterly and as offensively as possible those who are responsible for any overt act, or for permitting any state of affairs, which is unworthy of those traditions.

The Other Side of the Picture.

Let us turn now to the other side of the picture. Here is a story told by an officer of the R.A.F. which illustrates excellently precisely what ought not to be in the R.A.F. It may be true or it may not, but it certainly does indicate a state of mind which exists in the R.A.F.

The story goes that an R.A.F. officer employed in some technical capacity at an Air Station had on the Station an ex-R.F.C. technical Serjeant who had been trained in the Barrington-Kennett tradition. The officer, it would appear, had been trained in the worst of the R.N.A.S. traditions.

One day he sent for the Serjeant who, in accordance with the smart R.F.C. custom, came into the office, tucked his cane neatly under his arm, came to attention with a jerk, and saluted with that vibratory motion of

the hand which is regarded in certain units as the acme of smartness and gives the impression that the arm of the saluter is composed of spring steel.

The officer turned on the man and shouted—"Damn you! When you come into my office, leave your stick outside, and when you come to attention don't shake the blasted place to pieces!"

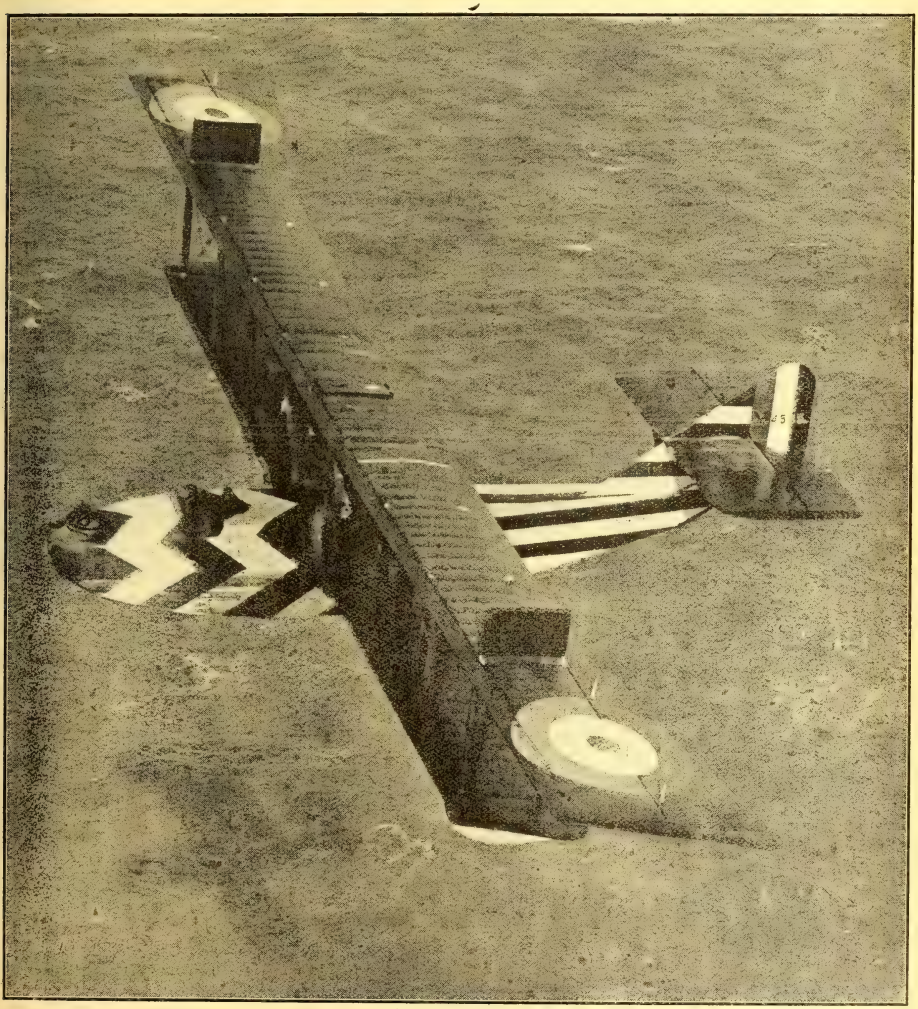
The narrator of the story, who evidently thought it was extremely funny, further stated that when all this "infernal nonsense" had been knocked out of the Serjeant he became quite an efficient technical N.C.O.

A Cad and a Fool.

As a matter of fact, if the story is within measurable distance of being true, the officer who addressed the Serjeant in such terms was not only a cad but a fool. In the first place, no officer who had any pretentions to being a gentleman would address anybody under his command in such terms.

It must be noted that there is a very wide difference between cursing one man individually when he is really doing his best and cursing a company or a regiment on parade in general terms for the good of their souls.

In the second place, if the officer in question had been even threatened with intelligence, he would have known perfectly well that the man who springs smartly to attention and who indulges in the little affectation of carrying a little swagger-cane to be tucked neatly under the arm when saluting an officer is a man who will not



ON PATROL.—A dazzle-painted F.2a. Flying-Boat. (Two "Eagle" Rolls-Royce Engines.) One of the Pictures shown at the R.A.F. "War in the Air" Exhibition at the Grafton Galleries. These Boats have done good work during the late war—both with the R.N.A.S. and the Naval Branch, R.A.F.—on Submarine Patrols. These Boats are a development of the Porte Boats designed by Lieut.-Col. J. C. Porte, C.M.G., R.A.F. (late Commander, R.N.).

only do his own work smartly, but will see that everybody under him is equally smart.

As It Was and As It Is.

To those who recall the smartness of the R.F.C. in the early days, and the resounding crash with which a squadron on parade came to attention on the tarmac, it is perfectly heartbreaking to see the men fall in at some of the R.A.F. Stations of to-day. With their pudding-like Naval caps, their beltless sloppy cast-off Army tunics, their trousers baggy at the knees, their slouching shoulders, and their slovenly walk, they look more like a lot of convicts out of a gaol, or the dregs of a labour battalion about to be demobilised, than any unit of what should be the smartest of the King's Services. And the blame for this state of affairs rests on the type of fool who swears or jeers at the smart N.C.O. trained in the Barrington-Kennett tradition.

Smartness on parade is, in the words of the catechism, "an outward and visible sign of an inward and spiritual grace," and the officer who does anything to detract from the smartness of the Air Force is doing the gravest possible dis-service to the country.

Another Story.

There is another story told which indicates the same foolish spirit in another manifestation.

In this case a technical officer narrated how on going into an aeroplane shed he found a baulk of timber in an inconvenient position and told an R.F.C. N.C.O. to move it. The only air-mechanics in the shed happened to be working on an engine, and the nearest one, according to the story, had his mouth full of screws out of the distributor and his hands full of bits of the magneto.

The N.C.O. ordered him to move the baulk of timber, whereupon he dropped the screws and the magneto parts in among other parts of the engine on which he was working and proceeded to move the timber. The teller of the story seemed to be under the impression that the N.C.O. should have moved the timber himself and should have let the air-mechanic go on with his job, the argument being that time would have been saved and the air-mechanic would not have had the job of hunting for the dropped magneto parts.

It never seems to have struck the narrator that a technical N.C.Os. job is precisely that of a foreman in a workshop, plus the added need for asserting his position as a man to be obeyed with military promptness and precision. If an N.C.O. or a foreman takes to doing a man's work, then the men will expect him to do the work for them at all times and under all sorts of conditions.

In this particular case the N.C.O. was perfectly right in having the work of moving the timber done by the men whose job it was to do it. It is only by adhering strictly to correct military custom that discipline can be preserved and smartness maintained.

A Civilian Illustration.

There are of course times when an N.C.O. or a foreman, as the case may be, has to do a job of work himself merely to impress those under him with their own inferiority, as for example the classic story of the Irish foremen and the Italian paviours.

A gang of Italian labourers engaged in laying a road had the job of lifting a large water-pipe out of a trench alongside the road. Despite an immense amount of jabbering and gesticulating, a dozen of them failed to get it out, whereupon the Irish ganger walked down the road to another gang and said to another Irish ganger, "Come here, Michael, and gi'e me a hand."

So the two Irishmen got down into the trench and spat on their hands to get a good grip of the pipe. The leader said, "Now, Michael! Heave!" and with one swing the two of them hove the pipe out of the trench and deposited it on the road.

They climbed out, wiped their hands on their trousers in the approved fashion, and then the first jerked his thumb over his shoulder towards the Italians and remarked scornfully, "And begob, Michael! Thim is what they makes Popes of!"

In that case it was necessary to demonstrate the superior muscle as well as brain of the foremen, but it would have been extraordinarily foolish for the said foremen to have done the road-laying as a matter of habit, and it is equally foolish for any officer to expect his N.C.Os. to do work which should be done by air-mechanics and at the same time to maintain their position as disciplinarians.

It is this lack of understanding on the part of many otherwise excellent technical men who have been brought into the R.A.F. from civilian life which accounts for the sloppiness and inefficiency of the R.A.F., and a return to the old R.F.C. tradition is necessary if efficiency is to be re-established.

(To be continued.)



THE BIGGEST FLYING-BOAT HULL IN THE WORLD.—The hull above, designed and built by the Gosport Aircraft Company, Ltd., is here shown ready for transport to the works of the Phœnix Dynamo Manufacturing Company, Ltd., of Bradford, where it is to be fitted with its flying organs and power plant. The whole machine is the design of Mr. C. R. Fairey, of the Fairey Aviation Company, Ltd., and the combination shows how various competing firms have co-operated cordially in the production of aircraft of war. Another machine of similar design is being built by Dick, Kerr and Co., Ltd., onto a hull built by William Fife and Sons and designed by Major Linton Hope, R.A.F. Dick, Kerr and Co., and the Phœnix Dynamo Manufacturing Co. are now amalgamated under the name of The English Electric Co., Ltd.

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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

The R.A.F. Flag.

On the afternoon of Thursday, April 17th, an airship flew very low round Windsor Castle and quite close to the Round Tower. This ship was flown before the King, the General-in-Chief of the Royal Air Force, to display the new flag of the Force. This was the first occasion on which the flag has been flown on any aircraft. Major-General J. E. B. Seely, C.B., C.M.G., D.S.O., M.P., Under Secretary of State for Air, accompanied the flag.

The design has received the approval of the Air Council. In appearance the new flag is similar to the White Ensign of the Royal Navy. But a blue cross takes the place of the St. George's Cross in the White Ensign, and the centre of the flag bears in gold the Crown and Bird of the Royal Air Force.

The Aeronautical Commission.

The following official communiqué has arrived from Paris :—

The seventh and eighth meetings of the Aeronautical Commission of the Peace Conference were held on April 15th and 16th. The British delegates were Major-General Sir F. H. Sykes and the Marquess of Londonderry.

The Commission had before them full reports from their commercial, legal, financial, and technical sub-committees, to which were attached the 41 articles of the draft convention and its six annexes. On the question of the nationality of aircraft the analogy of merchant shipping has been followed to a certain extent, and the main principle is that this nationality should be governed by the nationality of the owner of the aircraft.

The Commission has decided as a matter of principle that certificates of airworthiness in the case of the aircraft and certificates of competency in the case of the crew are to be recognised as universally necessary in international flying.

The right of flying over a State from frontier to frontier is recognised, subject to the safeguard that the State flown over may compel a landing in the interests of national security, or, in other words, where reasonable suspicion exists that the flight is not bona fide. In the interests of domestic control by each State there are provisions as to the carriage of various papers of identity, etc., upon the aircraft, and the prohibition of the carriage of dangerous articles is also provided for.

The final provisions include an arbitration clause for the settlement of disputes and a clause which definitely places the convention on a peace basis as not affecting the rights and duties of belligerents or neutrals. Military aircraft are placed in a class apart, and may not fly outside their own country, except by the special authorisation of a State visited by them, in which case they are to be treated according to the usual rules prevailing in the case of ships of war.

The Convention contemplates the formation of a permanent international Commission, which will keep in close touch with all new developments and act as a clearing house for information on questions of air navigation between the respective States.

The Commission directed that a complete draft dealing with the various amendments proposed should be prepared for their next meeting.

Signals of Distress.

The Air Ministry made the following announcement on April 18th :—

In order to eliminate unnecessary risks of fatal accidents to aircraft and pilots, signals for aircraft in distress have been provisionally agreed upon by the International Aerial Sub-Committee of the Peace Conference in Paris and will be used in the future.

The signals, which may be displayed by the aircraft either together or separately, are as follows :—

1. The International Signal "S.O.S." by means of visual or wireless telegraphy.
2. The International Code Signal of Distress indicated by N.C.
3. The Distance Signal, consisting of a square flag having above or below it a ball or anything resembling a ball.
4. The continuous sounding with any sound apparatus.
5. A Signal consisting of a succession of White Véry Lights fired at short intervals.

These signals are subject to such modifications as may be published from time to time.

The Admiralty has issued a "Notice to Mariners" containing this information, and the Board of Trade is also notifying owners and masters of shipping. The Air Ministry has called the attention of all Service pilots to the new signals in the Official Weekly Orders.

An Historical Record.

According to the "Daily Mail" "General Allenby's entry into Jerusalem and an aeroplane are shown in a church memorial window."

It is believed that this is the first historical record of General Allenby's entry into an aeroplane.

At Bowler House.

Hearts are burning in the Bolo over the rumour that after May 1st acting ranks will no longer be held.

A typewritten form has been circulated among some of those who have been clothed in all the pomp and panoply of glorious office work. It reads :—

"Those Colonels and Majors who require non-brass hats are requested to apply at Room ooooo, Bowler House."

Modern Manners and Customs.

From the "Times" of April 15th :—

Aviation in Society.—An officer, retired R.A.F., anxious to determine the degree of inside influence at work which is permitting daily flights by various society ladies, is willing to take a limited number of ladies in society for flights during the next few weeks. No charge made.—Box, etc.

Post-Bellum Frightfulness.

The Bristol Fighter biplane lent by the Air Ministry to the Harma Photoplay Co. for the purpose of delivering films to cinemas recently made its first flight from London to Newcastle. It carried 6,000 feet of film and 30,000 leaflets, which were thrown overboard. Some of the leaflets were marked, and when the machine made its second flight from Newcastle to Leeds, it was announced that any person who found one of the marked leaflets would be paid the sum of £1. This appears to have caused some unseemly scrambles.

The threat is now made to attack London with leaflets in a similar manner. One finds it difficult to congratulate the Air Ministry upon this effort to encourage commercial aviation. If dwellers in cities are in the future to live in a perpetual snowstorm of fluttering leaflets the frightfulness of peace will be intensified. Doubtless there are hundreds of advertisers who would be glad to borrow machines from the Air Ministry in order to attract notice to Crimson Capsules for Colourless Cripples, Lilac Lotions for Languid Ladies, or similar popular panaceas for poorly people. But one does not desire that aeroplanes built at the cost of the public should be put to such uses. This is not the way to cause a commercial "boom," to use the expressive onomatopoetic word beloved by the advertisers of popular commodities.

The Postmaster-General v. Aerial Posts.

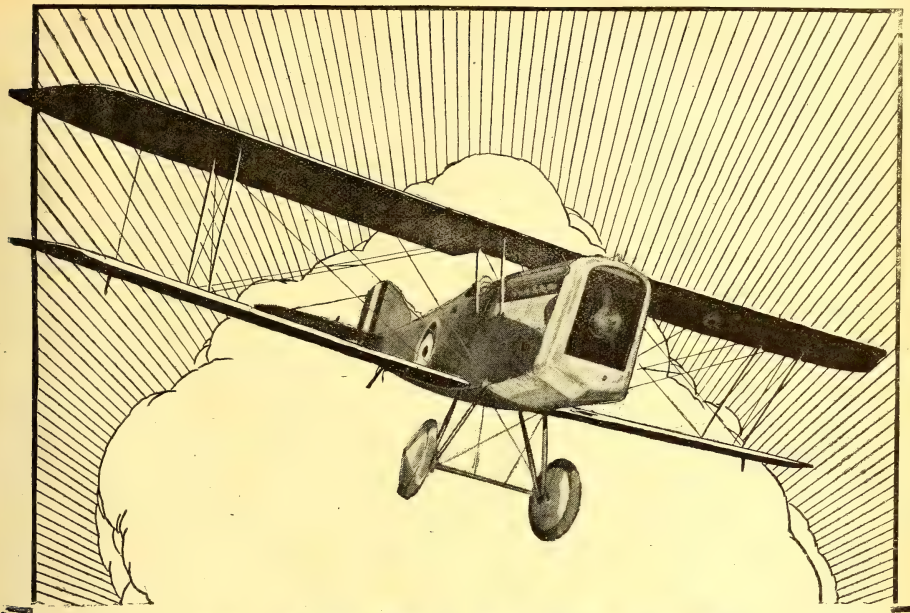
As reported in these pages last week, the Postmaster-General was asked in Parliament recently if any arrangements had been made for the provision of aerial posts in this country. Mr. Illingworth replied in the negative, and said :—"As soon as airmen can find London in a fog and land in a fog it will be practicable, but at present it is quite impossible, because the efficiency is only about 60 per cent."

A more futile remark has rarely been made. Are we to wait till the Continent has developed a highly organised system of aerial posts before we even commence to experiment seriously? What in the name of Big Ben is meant by efficiency of only about 60 per cent.? If time is the factor to be considered the efficiency is 200 per cent., or more.

Does Mr. Illingworth think that all the public expect of him is to allow his subordinates to carry on the organisation his predecessors have built up while he puts up a verbal barrage to hold in check those who wish to break through official apathy? Would Mr. Illingworth have waited for other countries to develop the telegraph before he was convinced of its efficiency compared with train-borne mails?

The Sleaford Fatality.

Sec. Lieut. Trevor Walter Chater, R.A.F., who, while flying on March 18th, 1919, near Sleaford, killed two convalescent officers, Capt. Dunn and Sec. Lieut. Pegg, who were driving to a meet of the Belvoir Hounds, was brought up at Sleaford Police Court on April 17th on a charge of manslaughter. He was remanded for a week on bail. The Coroner's inquest in this case had returned a verdict of "Accidental Death." The present proceedings are instituted under instructions from the Director of Public Prosecutions.



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The WORLD of AERONAUTICS (continued)

The R.A.F. Club.

The trustees of the R.A.F. Club have bought the premises of the Lyceum Club, Piccadilly. The R.A.F. Club, it is stated, will take over the premises at the end of May. The Lyceum is one of the best-known clubs for women.

The Death of M. Vedrines.

On April 21st, M. Jules Védrines, the French aviator, was killed while flying in the department of Drome. M. Védrines had started at 6.30 a.m. to fly to Rome. It is believed that the machine he was flying collapsed in the air. His mechanic, Guillain, who was flying with him, was also killed.

An Accident at Andover.

Three officers and two N.C.O.s—of the Royal Air Force—were killed in an accident to a night-flying Handley Page machine at Andover, Hampshire, on April 21st.

The names of the five killed are:—Major Thomas Archibald Batchelor (pilot), aged 33; Captain William Reginald Atkins; Lieut. Arthur Barlow Whiteside, aged 26; Flight-Sergeant Horace Henry Heales, aged 38; Corporal E. G. Ward.

The machine went up from the aerodrome at 2 a.m. to carry out a course of night training under war conditions. The night was fine and windless, but the ground was at times obscured by a mist.

While about to land, the pilot apparently lost his bearings, flew straight into the shed at a speed of at least 60 miles an hour. The machine overturned, caught fire, and also set the shed alight.

Major Batchelor was one of the most efficient and skilful pilots of the bombing wing at Dunkirk. He specialised on the bombing of Zeebrugge, and was wounded in an attack just before the Naval raid on that port. By his death the R.A.F. has lost a very valuable and gallant officer.

A Fanfare.

Blowing one's own trumpet is a poor sport, but when a fellow soldier in arms blares a fanfare in one's honour one may feel a glow of satisfaction.

Here are the opening bars played recently by the "Scientific American":—

"When the war started, Great Britain sent 66 airplanes to France. No one knew, then, what airplanes were to be in the war, still less that they were to be the deciding factor. At the same time France had about 140 machines in the air, but they accompanied a much larger army than Great Britain's first 150,000 expeditionary force.

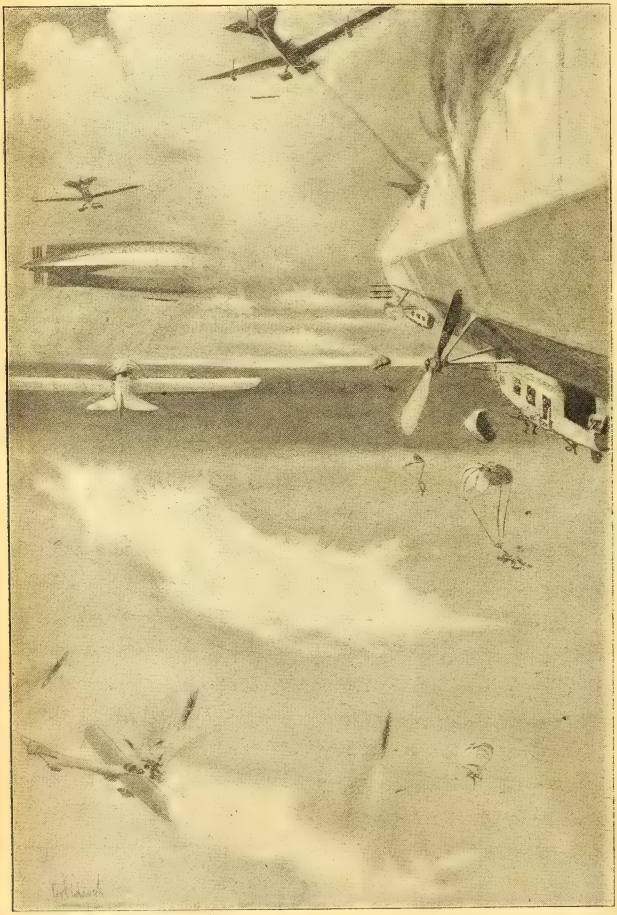
"When the United States came into the war, we promised, rather too rashly, to produce some 20,000 planes, perhaps in a year, but certainly within two years.

"We didn't do it. Great Britain made no promises, but what she did, though apparently little known, is far more than we promised to do.

"At the beginning of the war Great Britain's capacity for manufacturing airplanes was not greater than 100 per year. At the time the armistice was signed she was turning out planes at the rate of 800 a week! In other words, her production possibilities were demonstrated to be in excess of 40,000 planes a year! Think of that, and remember that it is not America, with her limitless resources of men and money and factory and raw material but the British Isles with their very much limited man-power, material resource and steel industry, which not only built the planes but engined them.

"And, then, as do all other fair-minded Americans who get the actual facts, take off your hat and bow in deep respect to a nation we of America are rather too apt to consider slow and old-fashioned in methods when it comes to factory production."

For those few kind words one thanks one's contemporary in the name of all readers. Our countrymen, thank God! are more fond of self-criticism than self-congratulations. Perhaps it is because we find fault with ourselves and are more apt to belittle than to magnify our efforts that we sometimes do rather well.



A PROPHECY.—This Picture was produced in 1912, by a draughtsman at Vickers, Ltd., Mr. C. W. Pidcock. The prophetic value of the effort is now evident. The parachutes are particularly noteworthy.

No. 34 Squadron Dinner.

A dinner has been arranged for May 7th, 1919, in London. All past and present Officers who desire to attend should communicate with Lieut. R. H. Luxton, R.A.F., No. 50, T.S., Ford Junction, Sussex, enclosing cheque for £2. Evening dress or uniform optional.

To 43 Squadron R.F.C

It is proposed to hold a dinner in London one day during May to which all present and past members of the above squadron are invited. Those who wish to attend are requested to communicate by letter with Captain L. Geach, 40, Sackville Street, Piccadilly, London, W.1, on or before April 30th, 1919

The Chronicles of 55

This book will be ready shortly. There is still a limited number of copies available for ex-members and others interested. The price is 10s.; any profits will be handed to a R.A.F. charity. Subscribers should send their permanent addresses and cheques (crossed Holt and Co.) to:—Capt. L. Miller, H.Q., R.A.F., France.

Flying at Madrid.

Major de Havilland, R.A.F., made several flights over Madrid on April 14th. It is stated by Reuter that he was proceeding to Seville on April 16th.


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The WORLD of AERONAUTICS (continued)

An Argentine Mission to Europe.

On May 5th there will arrive in England an Argentine Aviation Mission composed of Captains Brihuega and Zuluaga and Engineer Paravella. The mission has the intention of visiting the most important flying schools and factories.

European Missions to the Argentine.

Major Scott of the Gosport School of Instructors is now in Buenos Aires giving brilliant exhibitions with an Avro machine with great success. It is undoubtedly the best form of propaganda to send a machine in charge of a capable pilot, to give practical demonstrations over there.

The Mission sent by the Italian Government, with a view of propaganda, has arrived and has been received with great enthusiasm.

The French Government, following the example of the Italian, is ready to send a Mission with fifteen of the most modern machines, including two "Glisseurs," for the navigation of the Parana River between Buenos Aires and Asuncion.

Long-Distance Flying.

Two Handley Page aeroplanes in charge of Major Smitty, with Capt. Stewart and Capt. Snook as pilots, left Andover, Hants, on the morning of April 19th. They arrived at Edinburgh the same afternoon, and crossed to Belfast on the following day, landing at Ardergrene Aerodrome. They left Belfast for Cornwall *viâ* Dublin on April 21st.

Civilian Flying at Easter.

The Victory Easter, as the daily Press agreed to term the very chilly holiday, was notable for a considerable amount of civilian flying. About 600 people made short flights at the Handley Page Aerodrome at Cricklewood, and to judge by their remarks to the reporters who waited to interview the heros and heroines the majority appear to have found the experience less exciting than they expected. Possibly more were pleased than disappointed by the lack of thrills.

A charge of two guineas was made for a flight of about 15 minutes' duration, so it would appear that the provision of joy-rides to the public can be made profitable when large machines capable of carrying a number of passengers are employed.

The amount of free advertising given by the public Press should have the effect of causing many thousands of people to desire flights, and doubtless the possible thrill of being interviewed afterwards by real reporters should be an added attraction.

At Hamble there were many flights in Avro machines. Lieut.-Col. G. L. P. Henderson, M.C., gave beautiful exhibitions of skilful flying, and Mr. Hammersley and other pilots gave joy-flights to a large number of passengers. £1 per flight was charged, and this reasonable sum included the omnibus fare to and from Southampton. Two shillings and sixpence was charged for the omnibus fare without the flight.

Before the holiday it was announced that passenger flights would be given in an airship at the Bedford Airship Works and in Short seaplanes at the Rochester Seaplane Works, but up to the time of going to press no information is to hand.

Colonial Cadets.

To the Editor of THE AEROPLANE.

Sir,—I think that the English public should know the real facts of the double-dealing Air Force Cadets are receiving.

On this station there are still over thirty of us—all Canadians—with an average of three years' service before we transferred to the R.A.F.

So far as getting home is concerned we have almost given up all hope, but we do not like to see second lieutenants (who to dodge conscription in Canada last year ran to the R.A.F. as a last hope) getting home a few weeks after their repatriation papers were put in, while ours take months. They were commissioned at the Armament School, while all we receive is a bunch of promises that never materialise.

If the Air Ministry mean anything by their promises it is nearly time they showed something. It is all very well to promise commissions and kit allowance, but what good is it to us a year after we are back in "civvy" life?

Our case here is, by all accounts, not so bad as Blandford, but what do people think of Flight-Cadets, supposed anyway to rank as warrant officers, polishing "Pyrenes" while a bunch of air mechanics stand around laughing and the "1918 volunteers" go back home. And generally when there is any dirty work to be done we are used as airmen, but if, by chance, any money can be squeezed from us we rank as probationary officers.

I am sure if the public knew how we are putting in the time, at their expense, something would be done.

All of us have been away from home for three or four years and some have had over two years in France. Previously we had a good opinion of English ideas and institutions, but I never can say a good word for the R.A.F.

There never has been a promise made to us that has been kept and we are all sorry we ever transferred.

A DISGUSTED COLONIAL.

A British Entry in France.

News is to hand that the British Aerial Transport Company of London have entered a machine for the £12,000 contest to be organised by the "Echo de Paris."

Low and Show Flying.

The following interesting letter has been received:—

The incident of two Army officers being killed by an aeroplane while they were driving in a trap recalls experiences of low show flying on the island of Sheppey where I was engaged on aerodrome work during the war.

There was a small hill surmounted by a clump of trees opposite the house where we stayed. From the flying ground, a mile away, pilots came to practise low flying, and it was a very wonderful spectacle, though at times nerve-racking to see the machines performing circles and "eights"; mounting up over the tops of the trees, disappearing behind them, then reappearing round the side of the hill with a roar in a kind of railless "switch-back"!

On a certain Sunday afternoon two of us were walking on an open space where there is a public footpath and watching the evolutions of a looper and fancy flier, when the pilot seemed to take it into his head to give the foot passengers a scare.

He descended at a terrific pace and, swooping down, almost skimmed the footpath for 50 or 100 yards of its length. How near the ground he came I cannot say, but so near that we and several others, including some soldiers, involuntarily lay flat down to allow him to pass over us, and were not a little relieved to find we had not been actually hit!

Such exploits may be thoroughly enjoyed by the pilot, and may provide good practice for him. The passenger, when he has one, may have an anxious time.

There was a certain pilot at one time who was particularly daring, and on a bright, sunny day he took an Admiralty officer for a spin. It was the meal hour and we were sitting out between the hangars which lined one side of the flying ground.

We saw the start and watched the machine mount at a high speed right up into the blue and disappear over the top of a bulb of white, billowy cloud. He soon reappeared, swooping and turning, and then mounted till it was a competition amongst the onlookers as to who could still locate and point him out in the sunny blue. At last he was lost to sight of all and we sat down to await his reappearance.

After a short time we essayed again to see him and suddenly, as we were gaping up into the sky he (having dived without our knowledge) came from behind one of the hangars and went by us with a deafening roar, almost skimming the ground; then he mounted a little, swooped round and passed us again, so close that we flinched and gasped!

Later in the day I saw that Admiralty officer. His face was literally "as white as a sheet"!—W. B. SAYERS.

Class Names for Machines.

The following letter has been received:—

Sir,—In or about March, 1918, the Air Ministry, in conjunction with the S.B.A.C., formulated a scheme for the nomenclature of aircraft based on the practice of giving the nicknames to various types of machines obtaining amongst Service pilots.

All heavier-than-air craft were to be divided into two principal classes, land machines (including ships' aeroplanes) and seaplanes (including flying boats). Each main division was then to be sub-divided, the various sub-divisions being based upon the seating accommodation, weight, and number of engines in the machine.

Each sub-division or class received a class name, and all aircraft in any particular section were to be nicknamed in accordance with that class name. The following examples of the system may not be perfectly accurate, but will serve to indicate how the system was put into practical execution. Thus a land machine with a single engine and carrying one occupant must be named after a land bird (excluding birds of prey). As a practical example let us name the "Snipe."

Seaplanes of the same description were to be named after sea birds. Some of the other class names were fresh-water fishes, sea fish, inland towns in Great Britain, seaport towns of Great Britain, continental rivers, races and tribes, and attributes.

Although the class names were not perhaps always happily selected, the scheme was sound, as it enabled non-technical folk to grasp the salient points of the various machines on hearing the nicknames.

However, with the laxity distinguishing Air Force administration the result was that whilst certain types were correctly named, others were incorrectly named, and merely retained their designers' names with the addition of a distinguishing number.

The purpose of this letter is to suggest that the scheme might be applied to commercial aircraft. New machines are being turned out with great rapidity, and the multiplicity of varied types will naturally increase with time. Could a simple scheme be formulated by the S.B.A.C. and rigidly adhered to by the various manufacturers, the public would be enabled better to grasp the general features of any particular type, and the technical man whose head is even now overburdened with masses of data greatly assisted.

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PARIS NOTES

Paris, April 21st.

It is understood that there will be an Aero Show in Paris in December next—if, bien entendu, the Grand Palais is given up by the Military Authorities. There is a lot of opposition to their continued occupation, but it seems to make no difference.

However, it is probable that it will be arranged that the Motor Show will precede the Aero Show, so that it will be the automobile people's misfortune if the military are not dispossessed in time.

As usual, the Aero Show will be held under the auspices of the Chambre Syndicate de l'Aeronautique, the president of which is M. Robert Esnault Pelterie.

The Italian Aero Show.

Aero Shows are very much discussed just now. Most of the leading French Constructors are preparing to exhibit at the Italian show which will be held at Milan from May 18th to July 31st; as a matter of fact it is to be held on the military aerodrome at Taliedo under the auspices of the Lega Aera Nazionale.

A Technical Competition will be one of the features. This will be divided into two classes, one for small touring machines and the other for large commercial machines. Would-be exhibitors must send in their entries to the above-mentioned league accompanied by a deposit of ten lira. For the benefit of English firms who may like to exhibit, the following rates for stand space are given:—2-5 sq. metres, 50 lira the metre; 5-10 sq. metres, 30 lira the metre; 10-20 sq. metres, 25 lira the metre; 20-50 sq. metres, 20 lira the metre; 50-100 sq. metres, 15 lira the metre; 100 and over sq. metres, 10 lira the metre.

Exhibits must be in place on May 10th, the insuring and decoration of stands is at the expense of exhibitors—any further information can be obtained from the Lega Aera Nazionale, 6, Via Signora, Milan.

Rome to Paris.

For some reason or other flights from Rome to Paris seem to possess an attraction or a utility not immediately apparent. On the 12th inst. Lieuts. Carabelli and Guera left Rome at 7 a.m. and landed at Montereau, 43 miles S.E. of Paris at 8.12 p.m. on the 13th inst. The return journey is to be made immediately. Lieut. Brenta and Srgt. Veroni, who left Istres at 9.30 a.m. on the 9th inst. and arrived at Rome at 2.30 p.m., five hours after thus covering 1,000 kms. by passing by Istres, Marseilles, Toulon, Nice, Genoa, Rome. The unfortunate sequel to Lieut. Roget's attempt to break the Paris-Rome-Paris record was mentioned last week.

New Aerogares.

There is to be an aerogare at Poitiers; Capt. Balignant has arrived there to select the best terrain.

An aeroplane service between Paris and Cabourg on the Normanly coast is being organised for the summer season. The Cabourg racecourse is to be converted into an aerodrome. The machines carrying 14 passengers are likely to be of the Goliath series, and will perform the journey in less than three hours. Flying trips along the coast will also be arranged.

A Universal Custom.

In accordance with universal custom over here the Club for Military Pioneer Aviators has decided not to charge its members any subscription fee during the whole period of the war.

Official Information.

"L'Auto" tells a piquant story. Requiring some information, they rang up the Under Secretary for Aviation, and the following conversation ensued:—

"Can you give me the 'phone number of the Service des Fabrications Aeronautiques, s.v.p.?"

"Passy 13.50, Monsieur."

"Many thanks."

"L'Auto" rings up Passy 13.50.

"Is that the Service des Fabrications de l'Aeronautique?"

"Mais, non, Monsieur; it removed from here on Feb. 15th."

Yet the Under Secretary's own office did not know!

American Aviation in Paris.

On the 11th there landed from all points of the sky over 100 machines from American Squadrons. Several of them had been captured from the Germans. The pilots and observers of these machines were present on the 12th inst. at the Opéra Comique, where they were presented with Squadron Pennants, embroidered by Frenchwomen. On the 13th inst. these aviators gave exhibitions of stunt flying.

Pilots' Pay.

I was told the other day that Farman is paying his regular pilots, such as Boussotrot, at the rate of five thousand francs a month. I am reminded of this by the news just published that pilots and mechanics engaged on ferry piloting or similar work under State arrangements receive for each journey of 10-30 km., 2 frs. 50 cs.; 30-150 km., 5 fcs.; 150-300 km., 10 fcs.; 300-500 km., 15 frs.; 500 and over, 20 frs.

On the total of voyages made in a month, counting from the 1st to 30th and 31st, 5 cs. for each kilometre after the first thousand, and 10 cs. for each km. over 2,000.

A Central Aerodrome.

At last it seems possible that the demolishment of the old "fortifs" of Paris will be commenced, and, apropos, there is a proposition on foot to reserve a certain part of the liberated space as an aerogare—if the suggestion ever becomes a fait accompli Paris will certainly be able to boast of the most central aerodrome.

Frenchwomen Who Fly.

Mlle. Jane Hervieu is to resume flying with a view to taking up passengers during the summer season.

Mlles. Madeleine and Helen Victor-Duroy have hit upon the novel distraction of taking a weekly joy-ride. Possibly this practice will become fashionable with people of means. Last week their jaunt was over the Seine Valley on a Farman F.45 triplane. They and their mother are visiting Brussels on the Goliath next trip.

A Presentation.

In the presence of an enormous crowd the French aviators left Lausanne on the afternoon of the 10th. Capt. Lavergne was presented with a souvenir cup.

A Good Flight.

From Brussels comes the news that a Belgian military machine, twin-motor, piloted by Lt. Georges, with two passengers, completed, on the 9th inst., a trip Brussels-London-Paris-Brussels in seven and a half hours' total flying time

Pilot to a Royal House.

Crombez, who is the pilot to the Royal House of Belgium, occasionally takes the Queen, and at other times the King, for a trip in the air. The other day at Her Majesty's request he gave the Queen the thrill of a spin. On landing the Queen said to Crombez: "The King will be so jealous because he has not yet had a 'spin'!!!"

The Ace of Aces.

The Belgian Ace of Aces, Capt. Willie Coppens, who has been under treatment in Paris after having had his leg amputated, has returned to his home in Brussels.

To people who commiserated with him he is reported to reply: "Yes, I certainly have lost my leg, but I've got a lovely collection of ribbons; that's one good thing." The story has more point when it is explained that he has been the recipient of the Legion d'Honneur, Order of Leopold, Order of the Crown of Italy, Military Cross, Serbian Eagle, Belgian Croix de Guerre, and French Croix de Guerre. He was hit for the first time a few weeks before the Armistice.—F. T. N.

Italian Notes.

The excitement of the week has been the announcement made even by the best quoted technical journals that the Fiat firm are entering one of their daughter-firm's machines for the cross-Atlantic flight—a S.I.A.9b, with improvements and a floating body. Presumably, it will be engined by the latest big Fiat. The names of Captain Guidi, R.E., and of Lieut. Brack-Papa are given as the pilots.

Dirigible Problems.

As straws sometimes indicate the wind's direction, it is notable that much attention is being paid to dirigible balloon problems by the official aero organs here. In the "Aeronauta," as merely one instance, Col. Crocco devotes himself with all his skill to the contemplation of the best attitude of a pilot when obliged to travel in the face of a stiff wind. He proves mathematically that it is desirable to travel as slowly as is consistent with safety on the score of economy in every direction.

The Veteran M.1.

M.1, that old veteran, has now got her smart two-floored cabin fixed up, and was in the air a few days back at Rome with 54 officers on board. Let us hope that they were not so invaluable to aero-navigation as the Commander-Major Leone and his assistant navigating officers. The total weight carried by the vessel was 4,000 kilograms.

Good Dividends.

If I have calculated correctly, the dividend paid by the Caproni business for last year is the very honest one of 3 per cent. That of the Macchi firm is nearly double this. By-the-bye, I am told tha the latter firm's flying boats may be given a new and distinctive name.

Probably a Fine Performance.

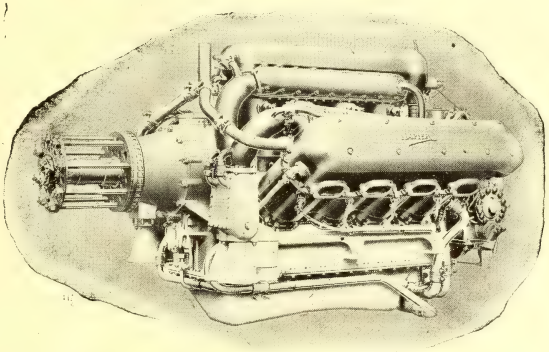
A flight of 1,000 kilometres in five hours has been reported in the papers, but I have not been able to verify the percentage of adulteration imported by them into what was probably a very fine performance, judging from the names of the man and the machine.—T. S. H.

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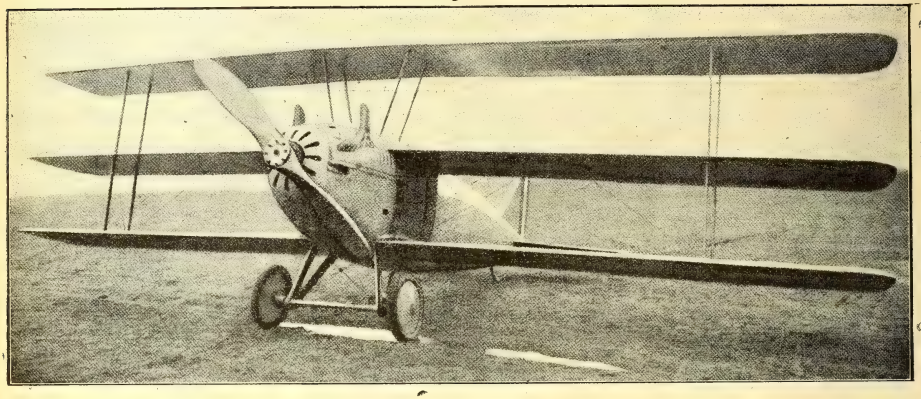
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THE NEW YORK AERO SHOW.—(*Continued.*)

By "Austerlitz."



The Curtiss Model K Triplane (Curtiss Engine).

The French used to say that every people has the government it deserves—which does not seem highly complimentary for the Russians and the Huns; and one might paraphrase this to read that every aero engine has the aeroplane it deserves. That is to say, the cleverest aeroplane design cannot overcome a dud engine, or one not adapted to the needs of the particular machine.

The Americans have given us some striking lessons in this respect. At the time when official Washington abandoned themselves to a war-dance—figuratively speaking—owing to the extraordinary things the Liberty engine was credited with being capable of doing, some expert had the happy thought of ordering the Bristol two-seater fighter and the Spad "rebuilt" to take the Liberty. The Spad never went beyond the initial stage, when the orders were revoked, for it suddenly dawned upon somebody that the 'bus could never fly; as to the Liberty-Bristol, it is said that after thirty-five of these had been built and twenty-two pilots paid the penalty of testing them with their lives, this order too was jilted. Lack of a suitable engine was thus responsible for the fact that the U.S.A. had no single-seater fighter of original design in the Great War, and it was only when the 300-h.p. Hispano-Suiza entered the production stage that American designers were able to produce fighting scouts to their own ideas. The Thomas-Morse, previously mentioned, is an illustration of this case.

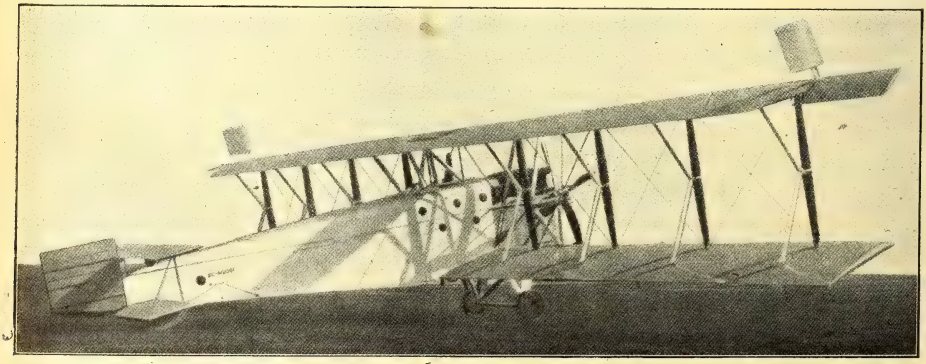
Two-seater fighters were not so much handicapped by the engine problem; the Liberty was fairly successful in making a tolerably good job of the American DeH4A, and since the 300-h.p. Hispano and the new 12-cyl. 400-h.p. Curtiss have been put on the market, American "airplane" constructors have developed some excellent two-seater fighters of original design.

Among these the Loening monoplane, with a 300-h.p. Hispano, is probably the most striking in appearance and performance. This machine has a gross weight of 2,368 lb. and a useful load of 1,328 lb. for a wing area of 230 sq. ft., which gives a wing loading of 10 lb. per sq. ft. and a power loading of 7 lb. per h.p. The wing loading would seem rather high, though it should be remembered that monoplanes are always loaded more heavily than biplanes; on the contrary, the power loading is very low, and accounts for the good climb of this machine, which has reached 20,000 ft. in 20 minutes. Owing to the clean lines of construction the horizontal speed is naturally great, 145 m.p.h., which is quite remarkable considering the useful load carried. The construction of the Loening mono is interesting, too, on account of the steel struts used for bracing the wings to the body, all wires being thus eliminated, with a great saving of head resistance, while the body is built up of longerons and three-ply bays which should make an immensely strong combination.

Another remarkable two-seater fighter is the Curtiss 18-B biplane, which carries a 400-h.p. Curtiss K-12 engine. The body represents probably the most perfect streamline which has yet been given to an aeroplane, so there is nothing astonishing in the claim that the machine will make 160 m.p.h., based on unofficial trials. It is proposed to convert this machine for sporting purposes into a three- and four-seater. With a useful load of 1,076 lb. the Curtiss 18-B has climbed 15,000 ft in 10 minutes, and should thus prove an excellent two-seater fighter, the more so as it carries two Marlin guns forward and two Lewises aft, on a gun ring.

The Curtiss Co. also exhibited a single-float seaplane built along similar lines, which is notable for its squat body. It carries a Liberty-12, and has been developed to answer the requirements of the Navy for a "fighting escort." A high speed of 132 m.p.h. and a climb of 8,500 ft. in 10 minutes is claimed for this machine, which carries a useful load of 1,000 lb. and weighs, fully loaded, 2,638 lb.

A two-seater fighter and daylight bomber which attracted considerable attention on account of its formidable armament was the L.W.F. model G-3. This machine mounts four synchronised Marlin machine guns forward and two Browning guns aft, one of the latter being fitted to a Scarff mount, while the other fires



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through a trap-door in the fuselage. As the L.W.F. is furthermore armoured around the cockpits, and carries four 120-lb. bombs, it should prove a formidable antagonist, particularly as a trench fighter. Its high speed is 131 m.p.h. and the climb is 10,000 ft in 15 minutes.

A 10-Passenger 'Bus.

Other military machines exhibited which are well known to the readers of The Aeroplane included a Spad, an SE-5A, a Curtiss JN-4, and a Handley Page, with two Liberty's—wherefore they do not require comment. Less well known abroad is the Martin twin-engine night bomber, with two Liberty's, four of which were purchased towards the close of the show by an aerial transport company of California, and will be converted into 10-passenger 'buses, with two pilos. The Martin has a high speed of 113 m.p.h., and carries about 4,000 lb. of useful load. It is very stable and yet easily manœuvred, and pilots who have flown it like it quite well. Constructionally it is a creditable job, though not particularly original in outlay, the influence of Handley Page being obvious.

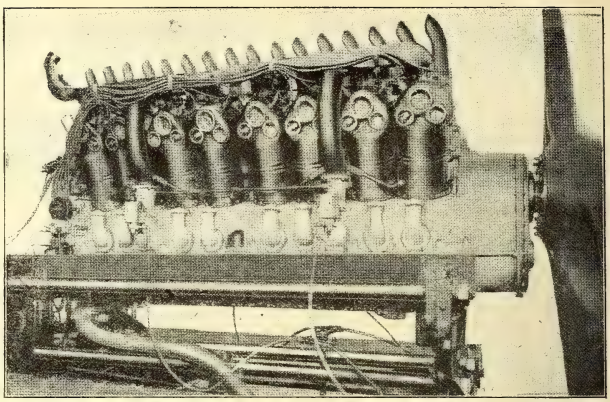
A two-seater of the advanced training type, which should make a splendid 'bus for red-blooded sportsmen, and was most beautifully finished, was the Vought VE-7bis. This has a 150-h.p. Hispano, a high speed of 116 m.p.h. and an all round excellent performance. It weighs, in full flying trim, 1,900 lb.

The Packard Automobile Co. exhibited a specially designed sportsman's model tractor biplane, which was built around their new 160-h.p. V-type 8-cyl. engine. This two-seater is, however, still in the experimental stage, so comment must be withheld for the time.

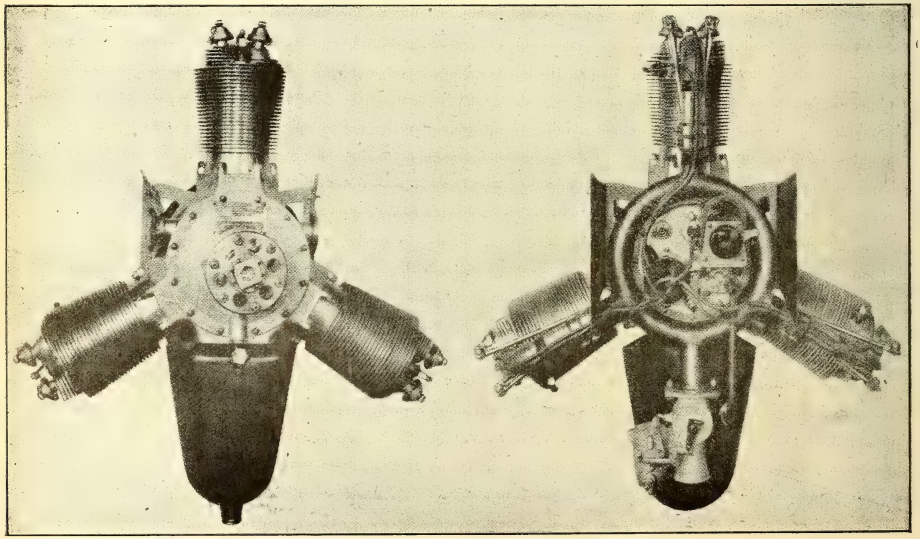
A Huge Flying Boat.

One of the most impressive machines of the show was an F-5-L flying-boat by the Naval Aircraft Factory, in Philadelphia. Its great size—102 ft. in span—was emphasised by the Leening "Kitten," which had been set up under one of its gigantic wings, and looked as if it could be carried comfortably on board the F-5-L.

This machine belongs to the large patrol class of the Navy, and is a development of the Curtiss H-12 and H-16 boats, which have been redesigned in detail by the Navy people with a view to increasing seaworthiness and offensive power. The boat was shown half stripped of its planking, as were the wings of their covering, so the public got an excellent opportunity for examining the craft at leisure. The construction of the F-5-L is throughout of the highest class and is really a monument to the engineering skill of the N.A.F. people, both as regards naval and aeronautic features. The armament is not the least interesting point about this boat, and consists of a non-recoil 2-in. Davis Q.F. gun, mounted on the bows, with a Lewis fitted on top—which is used for tracing the shots of the big fellow—and ten machine guns, mounted as follows: Aft of the Davis, but in the same cockpit, is a Scarff mount carrying twin Lewises, and another pair is carried on a gun-ring aft of the wings; inside the body, behind either board and partly under the wings, is a triple set of Lewises, which can be swung outboard through a watertight sliding door. With this arrangement it is claimed that there is no blind spot of any importance to this machine—and one readily believes this to be the case. Altogether, the F-5-L may be taken as an indication of how naval seaplanes will develop in the future towards aerial cruisers.



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The Lawrence 60 h.p. Air-cooled Aero-Engine, an American effort which looks well.

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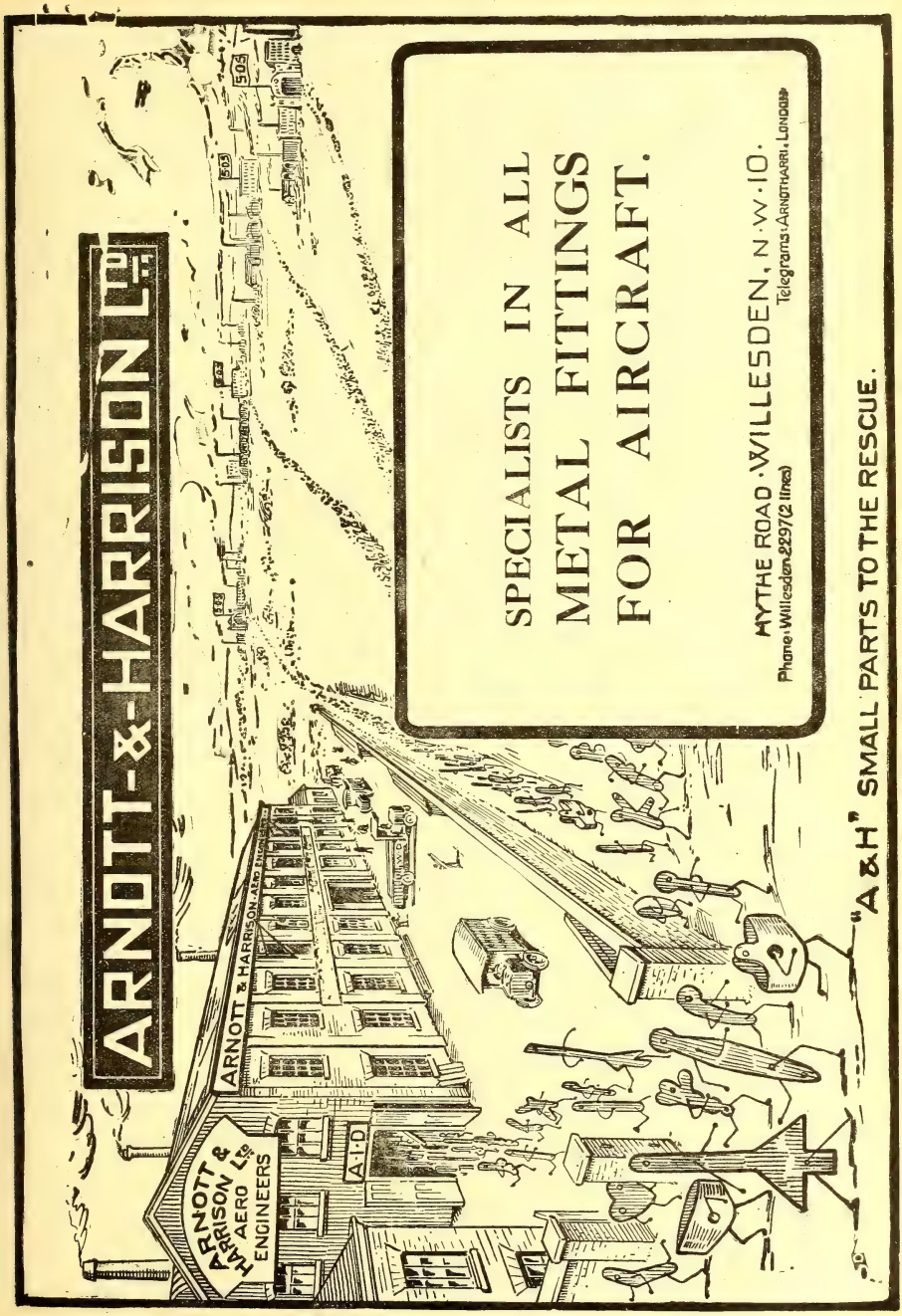
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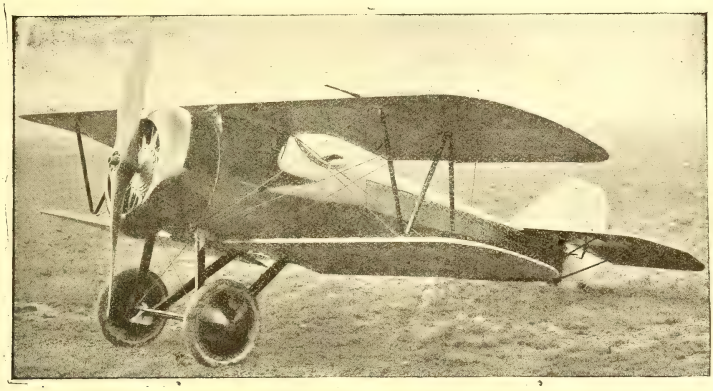
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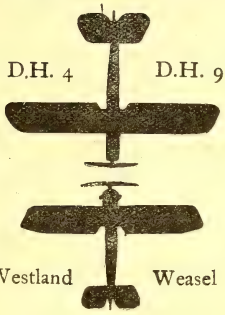
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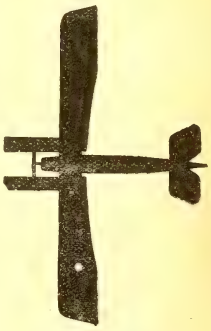
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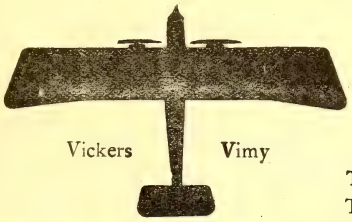
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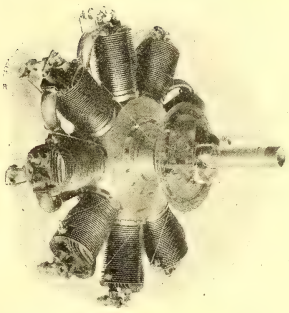
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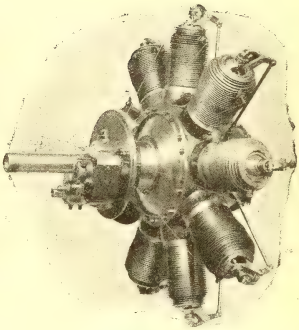
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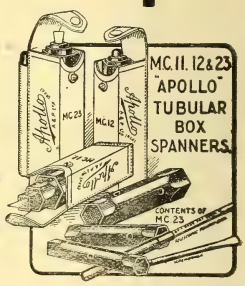
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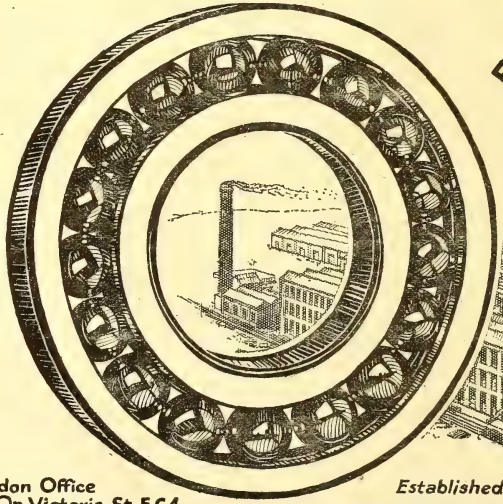
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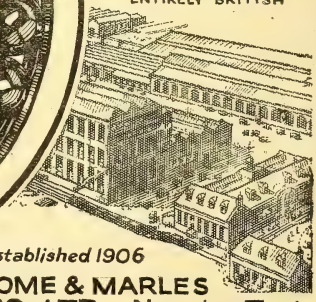
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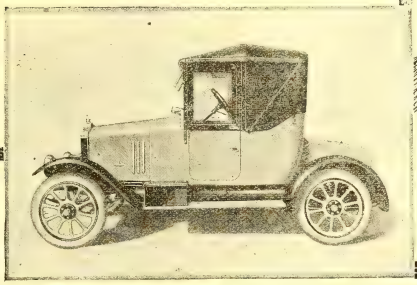


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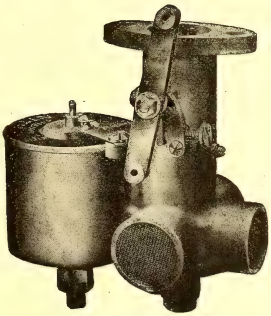
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THE WEEKLY COMMENTARY.

In this week's issue a series of articles describing the products of the world's aircraft manufacturers since August, 1914, is begun.

The first instalments deal with the firm of A. V. Roe and Company, and the series will deal firstly with the British aircraft manufacturers and their machines.

In the tenth instalment of the series on "The Design of Commercial Aircraft," Capt. Sayers discusses the design of a high-speed passenger-carrying machine, with particular reference to the effect upon its qualities of the nature of the load carried and the method of its distribution.

This machine will be compared with machines intended to carry the same total weight and designed for equal performance, but with loads of different types differently distributed.

An article descriptive of the development of the common or garden tap into the complicated petrol valve of to-day, and of the variety of purposes to which it has been adapted, will be found in this number.

COMMERCIAL AIRCRAFT DESIGN.—X.

HIGH-SPEED PASSENGER CARRIERS.

By Capt. W. H. Sayers, late R.A.F.

To give a more definite idea of the effects on design of the class of load which has to be carried, and of the way in which that load is distributed, it is proposed to consider the design of a series of machines, all of them intended for equal maximum loads, equal performances, but in which the nature of the load and the manner of its distribution is varied.

It is thought that the most graphic examples can be obtained with machines of such a size that it is a debatable point as to whether the normal centrally loaded single-engined type can be economically used, or whether a twin-engined machine with distributed weights will not serve the purpose better.

The standard which has been adopted for load and for performance has therefore been fixed at 1,200 lbs. of useful load, pilot, and 4 hours' full power fuel, at a maximum speed of at least 120 m.p.h. with a landing speed not exceeding 45 m.p.h.

Considering in the first place a passenger-carrying machine, 1,200 lbs. of useful load are equivalent to 8 passengers of 150 lbs. each, or to 6 passengers with 50 lbs. of luggage per head.

Few people will wish to make 400-mile journeys without taking some luggage, and the machine will therefore be designed to seat 6 passengers and 300 lbs. of luggage.

In the first instance an effort will be made to sketch out a design for a single-engined tractor machine to meet the case.

It is absolutely essential, if such a machine is to be successful, that it shall be of as small overall dimensions as possible, as otherwise the structure weight will become great, and it will demand a greater total horse-power than can be obtained in a single unit.

This points to the use of a heavy wing loading, but the landing-speed limits the extent to which this may be carried.

Using a high lift wing, and with a machine of the 1½ wing type, the loading may be raised to 11 lbs. per sq. ft. without exceeding the limit of 45 m.p.h. for landing.

With such a wing so loaded, the required top speed can be reached with from 12 to 14 lbs. per h.p.

Allowing for a standard of comfort not inferior to that provided in the stalls of the average West End theatre, the six passengers may be carried in a compartment 9 ft. long, 3 ft. wide, and 4 ft. 6 ins. high.

As both the passengers and the fuel must be carried as nearly as possible on the centre of gravity of the machine, the fuselage will have to be of greater cross section than the 3 ft. by 4 ft. 6 ins. required for the passengers.

The simplest arrangement is probably to place the fuel tanks beneath the floor of the passenger compartment and deepen the fuselage accordingly.

Making a first guess, one may estimate that an engine of round about 600 h.p. will be required.

It is here assumed that an engine of this output can be obtained, as it is known that such engines are in existence, though there are no records of extensive use of such high powers in actual flight.

Taking average fuel and oil consumption figures for modern engines, this calls for approximately 1,300 lbs. of fuel and oil for the specified duration of 4 hours. The required bulk is about 28 cubic feet, so that an addition of 1 ft. 6 ins. to the depth of the passenger compartment will leave ample room for fuel tanks in the required position.

This settles more or less definitely the maximum cross section of fuselage as about 6 ft. by 3 ft.

The engine weight, including water, will be about 1,500 lbs.; adding to this fuel (1,300 lbs.), useful load (1,200 lbs.), and pilot (150 lbs.), we have a total determined load of 4,150 lbs.

Taking 14 lbs. per h.p. as the extreme limit of loading compatible with the required performance, one finds that 8,400 lbs. is the maximum allowable total weight,

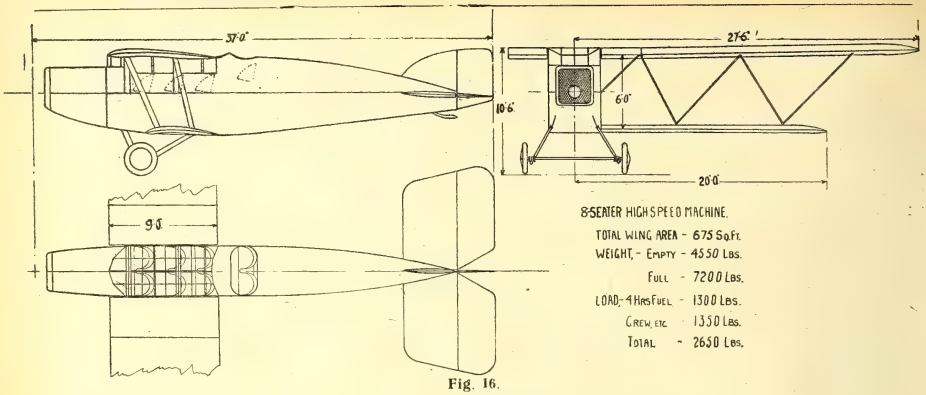


Fig. 16.

which at 11 lbs. per sq. ft. will give 765 sq. ft. as the maximum wing area which may have to be provided.

By a process of trial and error with slightly different dimensions, one arrives at the machine shown in Fig. 16.

The passenger saloon is directly beneath the centre section of the upper wing, the front end coinciding with the leading edge.

The centre of gravity of the full passenger load thus falls somewhat behind the position of the centre of gravity of the whole machine, which with full load is approximately midway between the two forward seats.

With four passengers seated two right ahead and two in the rear seats, or with two in either of the two front rows, there is only a very small change of the total C.G.

In accordance with a fashion which is just now very prevalent, the passenger compartment is shown disguised in the likeness of a hothouse, even to the closing in of the gap between the upper wings with a glazed roof.

Although at present it is doubtless a sound policy so to design machines intended for commercial passenger work that they may be readily diverted during their spare time to so profitable a use as the raising of out-of-season vegetables and fruit for the West End market, one feels that the popularity of this arrangement will wane rapidly after a few crashes in such machines.

Probably glass panelling in the front end of the compartment and one fair-sized glass panel on each side of each row of seats would satisfy the requirements of most passengers, when aerial passenger carrying becomes a real business and not a stunt. At present a substantial roof overhead does tend to give a feeling of security.

With seats as closely packed as in this case, a separate entry to each row is required. It would not be impossible to arrange for side entrance doors to each of the three rows, but it would need a rather heavy and complicated structure to maintain the strength of the fuselage across the openings. The simplest and lightest arrangement would be to enter, *via* a set of steps, the top plane, and through the roof.

The addition of one foot to the fuselage width would give room for a passage along the centre of the cabin, and a single side entrance could then be easily arranged to give access to all the seats. This would add rather a lot of head resistance and weight.

Also, the added width of body will restrict the pilot's view over the side when landing.

The pilot's cockpit has been placed behind the passenger cabin, high up in the fuselage, with a clear view over the top, and is not covered in. It may appear to be a preferable arrangement to seat him in the front of the passenger cabin. The objection to this is that it is impossible to see clearly through glass in a rain storm. If the panels are made to slide open for such occasions, the comfort of the passengers will be interfered with, and, more important still from the designer's standpoint, an opening of any size into so large a compartment will make a very big difference indeed in the total resistance.

The pilot's cockpit can be separately enclosed if desired, and fitted with sliding panels for use in rain or snow.

The fuselage would be built in the usual way, with four longerons and either struts and wire bracing or with diagonal (lattice girder) bracing. The upper longerons would be about halfway up the interplane gap, with all the seats above the longerons.

The passenger cabin and the pilot's cockpit would form a superstructure above the fuselage proper, with a light fairing behind the cockpit.

The wing structure shown in the sketch is of the wireless type. Where the lower wing is of considerably smaller span than the upper, and particularly where the lower chord is also small, this method of wing bracing has a considerable number of advantages, unless the machine is so small that a single row of struts on each side can be used. The arrangement is not, however, an essential feature of the design. There will be, for the same number of points of support, a saving in the weight of wing spars and a loss in the weight of bracings, as compared with struts and cross wiring, probably resulting altogether in a small gain. The total resistance will be little different in the two cases.

The "wireless" arrangement has the advantage that, as there are no lift wires to stretch with use, the wing cellule may be regarded as indeformable and not constantly liable to divergence from the truth.

With the main weights distributed over nearly 17 ft., a large tail area will be required to damp out longitudinal oscillations, and for its small overall dimensions this machine will be distinctly sluggish fore and aft.

In other respects the machine calls for no comment as to its general features.

The total estimated weight (7,200 lbs.) leaves no room for carelessness in detail design unless strength is to be sacrificed; but it should be possible to build the machine to that weight, provided that the engine weight does not exceed 1,500 lbs. (including water).

Allowing for the effect of the large area tail, it will be possible to land at 45 m.p.h. on a considerably greater total weight, and, since the estimated weight per horse-power is only 12, the top speed required will also leave a margin for some excess weight.

(To be continued.)

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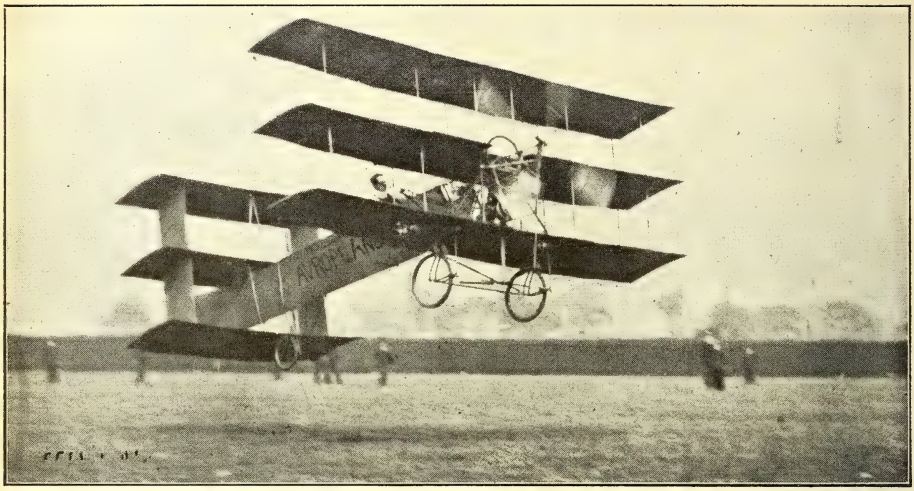
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Early in the summer of 1911 an "Avro" biplane made its first flights at Brooklands, piloted by Mr. Howard Pixton.

From this biplane the development of the Avro machines is to be traced through a very pretty little machine with a 30 h.p. E.N.V. engine, built for Mr. Duigan, the first Australian aviator, an extremely efficient two-seater with a 60 h.p. E.N.V. engine, a series of 50 h.p. Gnôme-engined machines ordered by the War Office, which were actually the first aeroplanes designed and built by a British firm to be delivered to the British Army, to the totally enclosed biplane with the 60 h.p. Green engine which gave so good an account of itself in the British military trials at Salisbury Plain in 1912.

Early in 1913 the famous two-seater Avro with an 80 Gnôme engine made its appearance. This machine—unaltered in all its essential aerodynamic features and in its main dimensions—survives to this day as the Standard Avro training machine.

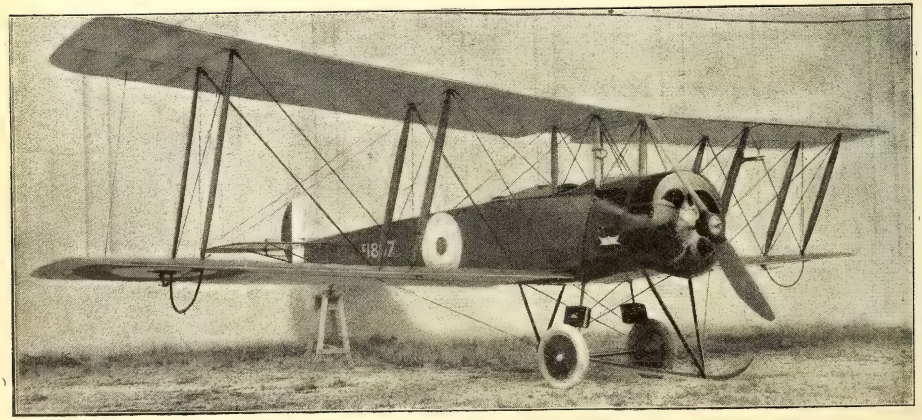
The Avro Standard Training Biplane.

By a process of detailed improvement, which has led to increased strength and greater simplicity, and by the adoption of standardised methods of manufacture, the 80 h.p. machine of 1913 has evolved into the Type 504 K, a machine admirably adapted for the methods of quantity production

General Remarks.

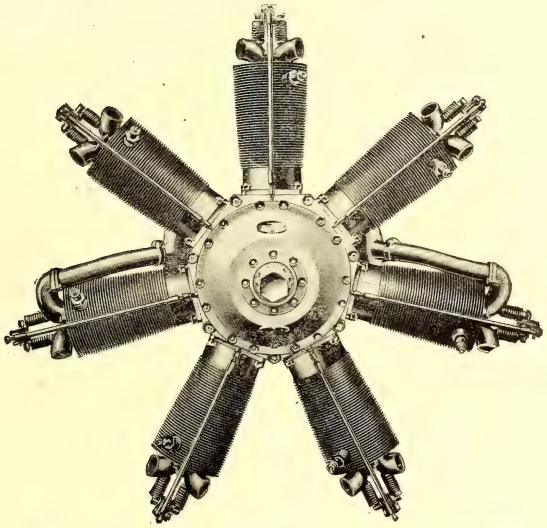
This machine is specially suitable for the purpose of training pilots, and has been adopted as the Standard Training Machine by the Royal Air Force.

In the 504.K. Type the nose of the machine has been altered and the engine mounted overhung from the bearers. The machine will now take any of the existing rotary engines up to 150 h.p. This has been accomplished by suitably designing the engine



Three-quarter Front View of the Avro Standard Training Machine.

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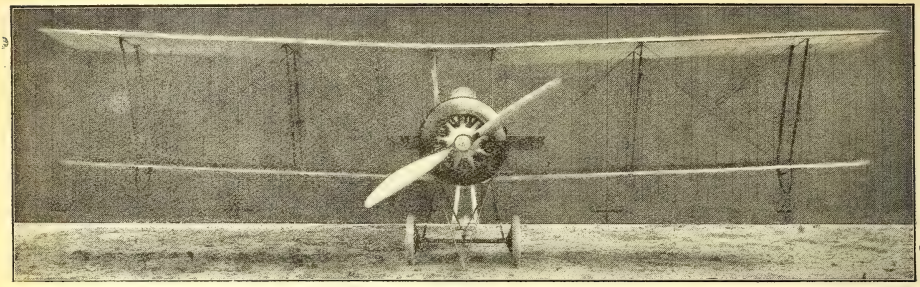
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Front View.—The Standard Avro Training Machine.

mounting and fitting adaptors to take the different engines. It will be seen that this is a great advantage from the engine supply point of view.

The machine retains its characteristics of simplicity, strength and controllability, and one of its chief advantages is the ease with which it can be repaired at School Workshops where interchangeable spares can be obtained readily.

SPECIFICATION.

The following tables give the main features of this machine :—

Type of Aeroplane .....2 Seater Biplane (Training Machine).
Aeroplane Specification....." Avro " Type 504K.
Engine .....100 Mono Gnôme, 110 Clerget, 110 Le Rhône, or 130 Clerget.
Revolutions of engine for stated b.h.p. .....1,250 r.p.m.

Maximum speed for the above horse-power and revolutions.

	m.p.h.
At ground level	95
At 8,000 feet	87
At 10,000 feet	85

Duration of flight at this speed.

	hrs.
At ground level	2
At 8,000 feet	2.14
At 10,000 feet	3

	m.p.h.
Minimum speed with full load near ground	40
Estimated speed at ¾-power at 8,000 feet	74
Estimated speed at ¾-power at 10,000 feet	71

	hrs.
Estimated duration at ¾-power at 8,000 ft.	3.7
Estimated duration at ¾-power at 10,000 ft.	4.25

Estimated climb with full load and with all fittings in position.

	mins.
To 3,500 feet	5
To 8,000 ft.	10
To 10,000 feet	16

Seating Accommodation—
Pilot, position ..... Level with trailing edge of lower wing.
Passenger's position ..... In front of pilot.

Airscrew—

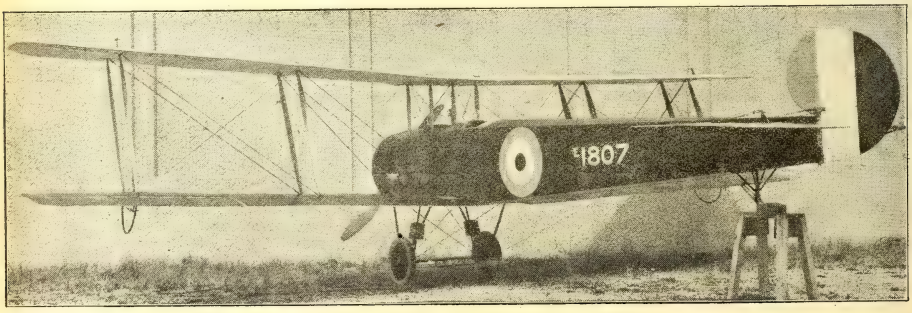
		ft.	ins.
Type	2 bladed " Avro."		
Pitch (110 Le Rhône)		8	8
Diameter		9	0

OVERALL DIMENSIONS.

	ft.	ins.
Span of top wings	36	0
Span of lower wings	36	0
Span of tail plane	10	0
Height overall	10	5
Length overall	29	5
Chord top wing	4	9
Chord lower wing	4	9
Chord tail plane	2	8⅝
Chord elevator	2	4

DETAILS OF WEIGHT.

Component.	Weight in lbs.
Tail Unit—	
Tail plane with supports	21½
Elevators	12
Rudder with levers and wires	8½
Total	42
Main Lift Structure—	
Wings, with flaps and centre section	260½
Interplane struts	41
Interplane wires	24½
Total	326
Alighting Gear—	
Undercarriage with axle and skid	65
Main wheels 100 × 700	40
Wing skids	2
Tail skids	6
Total	113
Hull—	
Body and engine housing	270
Aeroplane control gear and wires	30



Three-quarter View from Rear.—The " Avro " Standard Training Machine.

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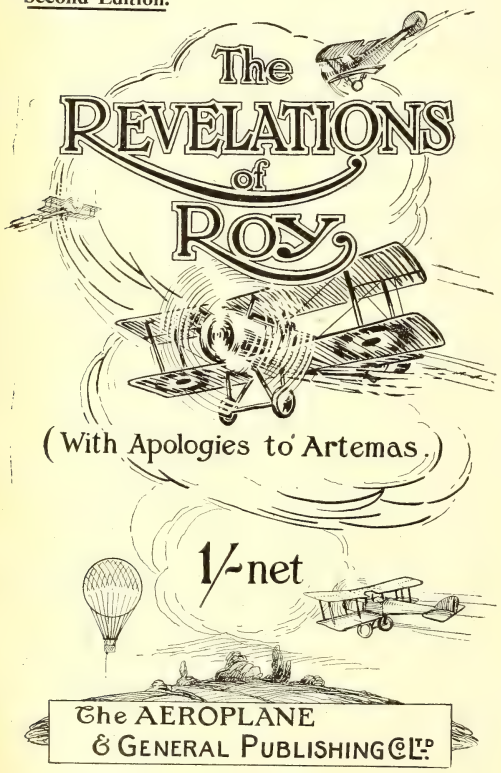
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Extract from Chap. II.

1. And when he was come unto Farn, Roy was compassed about by a great multitude.

2. And he beheld winged chariots of divers designs; thus, there were the Scout, and the Dolphin, and the Martinsyde, and the Camel, even that which produceth the hump.

3. And a man beckoned unto Roy; and on his arm he bare three stripes.

Extract from Chap. XXI (& last).

17. And in all thy ways consider this, that there be two things greater than any other in forming the character of him that flies; and the one is Energy and the other, it is Enthusiasm.

19. And take thou a pride in being an aviator; for hath not the great Hender said, These young men are the salt of the Earth.

20. Go thy way in courage and good cheer; and greet the Great Adventure with a song.

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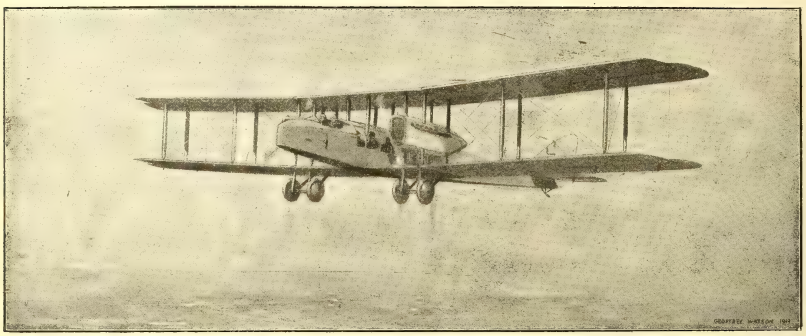
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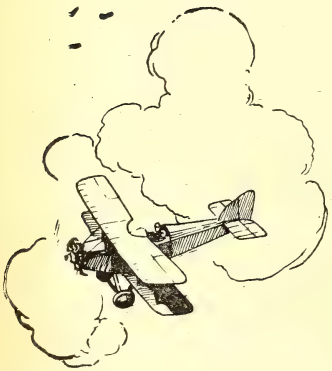
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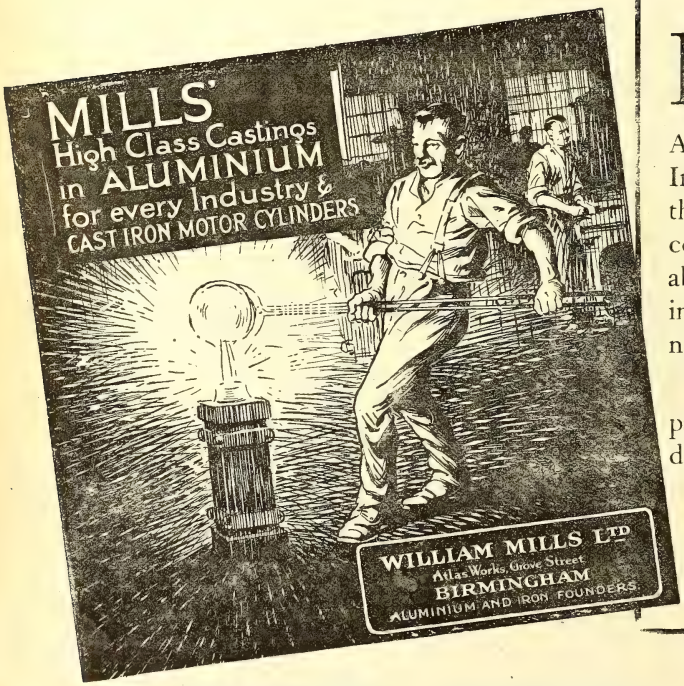
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Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet." Byfleet 1, 2 & 3.
Thames Aviation Works, 145, Curtain Rd., E.C.2. London Wall 976.
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Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927.

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Books (Aero Engines)—
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Buildings—
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Rubery, Owen & Co., Darlaston, South Staffs

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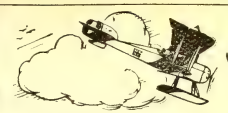
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Bray, Gibb & Co., Ltd., 166, Piccadilly, W.1.
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British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 0300.
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MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115.

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Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Eustroad, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—
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The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—
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The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149

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Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
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Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196

Screw-driving Machines—
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Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
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Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Wooston 37.

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Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

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Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
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The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).



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Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Vic 3540 (3 lines).

Aeroplane Manufacturers—

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Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

British Aerial Transport Co., Ltd. Head Office: 38, Conduit Street, London, W.1. "Batigrani Reg. London." Mayfair 637, 638.
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British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 1099.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hampstead 5551.

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Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1370.

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Gosport Aircraft Co., Gosport. "Flight Gosport." Gosport 247.

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London Office, 15, Regent Street, S.W.1. Regent 2087.

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Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St. James, London." Regent 912.

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 282 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge." Woking 331; Byfleet 171.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuport, Crickle, London." Willesden 2455.

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

The Regent Carriage Co., Ltd., 327/332, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplan, Manchester." City 5459-5431, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 103.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tusted, Phone, London." Regent 378.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 1988 (6 lines).

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin." Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet." Byfleet 1, 2 & 3.

Thames Aviation Works, 143, Curtain Rd., E.C. London Wall 9766.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyst, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, 0x, London." Museum 5666.

Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Airships—

Airships, Ltd., High Street, Merton. Wimbledon 1314.

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, Phone, London." Regent 372.

C. G. Spencer and Sons, Ltd. (See under "Balloons.")

Air Transport—

British Aerial Transport Co., Ltd. Head Office: 38, Conduit Street, London, W.1. "Batigram Reg. London." Mayfair 637, 638.
Works: Hythe Road, Willesden, London, N.W.10. "Aerbrirans, Phone, London." Willesden, 2272, 2273.

Aluminium Castings (Sand and Die)—

Coan, R. W., 210, Goswell Road, London, E.C.1. "Crankcases, Isline, London." City 3849.

Balloons—

C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronaut, London." Dalston 1895.

Bent Timber Parts—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London." Museum 496.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Bearings (Etonia Cast Phosphor Bronze)

Brown Bros., Ltd., 61, Eastern St., E.C.1.
Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3027.

Blinds—

J. Avery & Co., 81, 61 Portland Street, London, W. "Velarium, London." Gerrard 6620.

Blowpipes (Oxy-Acetylene)—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Vic 3540 (3 lines).

Bolts—

Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16. Dalston 2500 (2 lines).

Books (Aero Engines)—

Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2.

Buildings—

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Rubery Owen & Co., Darlaston, South Staffs.

Cable Coverings and Cable Controls—

The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green." Acock's Green 105 & 104.

Bowden Wire, Ltd., Willesden Junction, "Bowirelmi, Harles, London." Willesden 2340 (3 lines).

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4070.

Casein—

Nienwhof, Surie & Co., Ltd., 5, Lloyd-Avenue, London, E.C.3. "Suricodon, Fen, London." Avenue 34 and 35.

Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2105.

Pimhill's Ltd., Euston Road, N.W.1. "Dunscad, London." North 3305.

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 2361 & 3424.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond. "Actos, Richmond." Richmond 1181.

Thomson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thomson Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—

—Mackennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3315.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafre, Piccy, London." Gerrard 5312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellulose, London." Regent 1691.

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyiron, Piccy, London." Gerrard 2561.

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 440.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 2456.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd. (Salmson), 85, Victoria Street, London, S.W.1. "Aero flight, Vic, London." Vic 7629.

Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge." Weybridge 550 (2 lines).

Green Engine Co., Ltd., Tinckenham, Richmond 1263.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 2080.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London." Gerrard 8426.

Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1. "Rolheal, London." Gerrard 1034-36.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 084.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Eleven-fold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames." Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1978.

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installine, Eastrad, London." Museum 70.

Premier Electric Heaters, Ltd., 259, 294, and 300, Bradford Street, Birmingham. "Peade, Birmingham." Midland 561.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2486.

Electric Cables—

E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 248.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W. "Installine, Eastrad." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Matchless, Birmingham." Birmingham 3022 Central (3 lines).

Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.



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Fluxes—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).
The Acme Controller Co. (Flexible), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—

Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 247.

Furniture (Office)—

Cook's (Rinsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 574 and 6150.

Galvanising—

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—

J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17. Vencner, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0806.

Gears—

Wild Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

Glue—

Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Percolin, Cannon, London." City 1206.

Improved Liquid Glues Co., Ltd., 61 Hermitage Street, E. (Croid.) "Exoroiden, Phone, London." Avenue 4041-2.

Meadine Co., 8, Arthur Street, E.C. Bank 4871.

Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1530.

Hack Saw Blades and Machines—

Victor Saw Works, Ltd., 2 and 3, West Street, Finsbury Circus, London, E.C. "Victus, Phone, London." London Wall 1880.

Heating and Ventilating—

Chas. F. Kinnell and Co., Ltd., 65 & 66, Southwark Street, London, S.E.1. "Kinnell, London." Hop 4740 (2 lines).

The Thames Bank (Blackfriars) Iron Co., Ltd., Tiger Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 7703.

Instruments—

Bristol Wright Co., Ltd., 35, Chancery Lane, W.C.2. Holborn 1368.

Instruments (Scientific, Altimeters, etc.)—

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

Insurance—

Aviation Insurance Association, 11, Royal Exchange Avenue, E.C.3. London Wall 1084.

Bray, Gibb & Co., Ltd., 160, Piccadilly, W.1.

S. Sackville & Sons, Duchy Chambers, 4, Clement's Street, Manchester.

Leather Cloth—

New Pegamoid, Ltd., 134, Queen Victoria Street, London. "Pegamoid, Cent, London." City 0704 (2 lines).

Lubricating Oil Refiners and Merchants—

W. B. Dick & Co., Ltd., 99, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines).

Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—

The British Lighting & Ignition Co., Ltd., 34a, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 410.

The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Actuated, Coventry." Coventry 278.

Metal Casement Manufacturers—

Henry Hope & Sons, Ltd., 45, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 1009 (2 lines).

Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 4243. Avenue 1432.

Metals in General—

Samuel Mercer & Co., 103, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6432.

Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.

Bayliss, Jones, & Bayliss, Ltd., Wolverhampton (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installine, Eastrad, London." Museum 70.

Rubery Owen & Co., Darlaston, South Staffs.

Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 210.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2486.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—

Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—

Anderson, D., & Son, Ltd. (Roots), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Inbrowned, Bethrood, London." London Wall 9500.

Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham." Central 793.

MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3315.

Motor Cars—

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 179/181, Euston Road, London, N.W.1. "Manegear, Eastrad, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Regent 1530.

Oils—

Anglo-American Oil Co., Ltd., 36, Queen Anne's Gate, London, S.W.

C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheerz, Cent, London." Central 11305 & 11306.

Parachutes—

E. F. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.

C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149.

Presswork—

Rubery Owen & Co., Darlaston, South Staffs.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd., "Avipod, Hyde, London." Hendon 9.

Kingsbury 101.

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 282 (4 lines).

Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 295478.

Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—

The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 29.

Rawhide Hammers—

Ira Stephens, Whitelands Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—

Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 406.

Rubber Tubing & Accessories—

Hancock, James Lane, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 & 3812.

Safety Belts—

C. H. Holmes & Son, 58, Albert Street, Manchester. "Scuiloh, Manchester." City 4432.

Screwing Die Heads—

Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0806.

Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 282 (4 lines).

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

Short Bros., Rochester. Seaplanes, Rochester." Chatham 625.

Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights

Brown Bros., Ltd., Great Eastern St., E.C.1.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Vic 3540 (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2486.

Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—

The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Rubery Owen & Co., Darlaston, South Staffs.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

"The Aeroplane" Buyers' Guide.—*continued.*

Solder Manufacturers—

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Sparking Plugs—

Brown Bros., Ltd., Great Eastern St., E.C.1. Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 255.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 61a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Robinhood Engineering Works, Ltd., Newlands, Putney Vale, S.W.15. Makers of K.L.G. Plugs. "Kaelgee, Phone, London." Putney 2132-3.

Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines)

Steel—

Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 2230 to 2237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield." Central 3522-3-4.

Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Tapes and Smallwares—

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115
C. E. Matthews & Co., Ltd., Castle Works, Bermondsey Square, S.E.1. "Webbance, Berm, London." Hop 4038.

Timber—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London." Museum 496.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Time Recorders—

Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—

Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349

Turnbuckles—

Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery Owen & Co., Darlaston, South Staffs.
Mann, Egerton & Co., Ltd., 317, Cleveland Street, London, W. "Installing, Euston-road." Museum 70 (4 lines).

Tyres—

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Central 3880 (4 lines).
The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—

Thomson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Varnishes—

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjap, Phone, London." Mayfair 6347 (5 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harlond, Wimbledon 45." Wimbledon 45 and 1395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Welding and Cutting Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines)

Welding Repairs—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac," Phone, London." Victoria 3540 (3 lines).

Wind Shields—

Auster, Ltd., 133, Long Acre, W.C. "Winflector, London." Regent 5910.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Triplex Safety Glass Co., Ltd., 7, Albemarle Street, Piccadilly, W.1. "Shatterlvs, Piccy, London." Regent 1240

Wire Gauze—

Greening, N., & Sons, Ltd., 16, Finsbury Street, London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082

Wire and Cables—

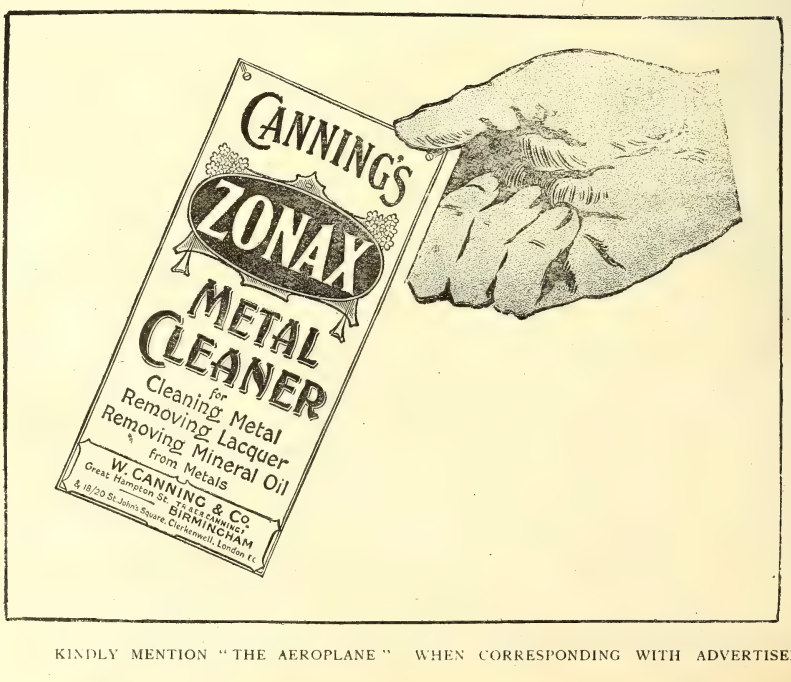
Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

Wirework—

Terry, Herbert, & Sons, Ltd., Redditch "Springs, Redditch." Redditch 61

Woodworking Machinery—

Robinson, Thomas, & Son, Ltd., Rochdale, "Robinson, Rochdale." Rochdale 467.
Sagar, J., & Co., Ltd., Halifax. "Sawtooth," Halifax." Halifax 136.
Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.



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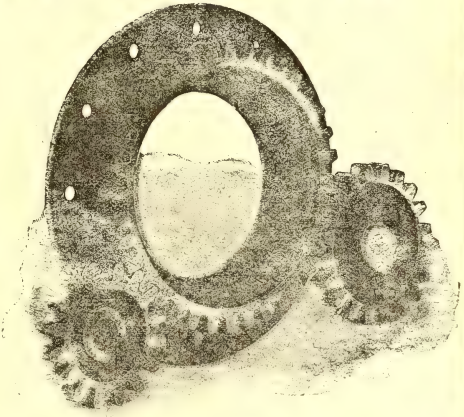
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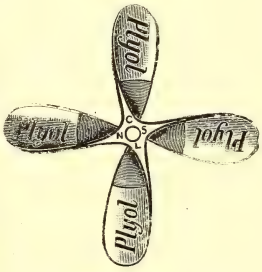


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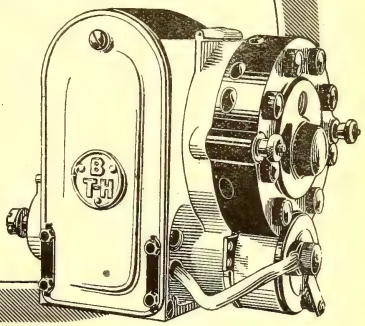
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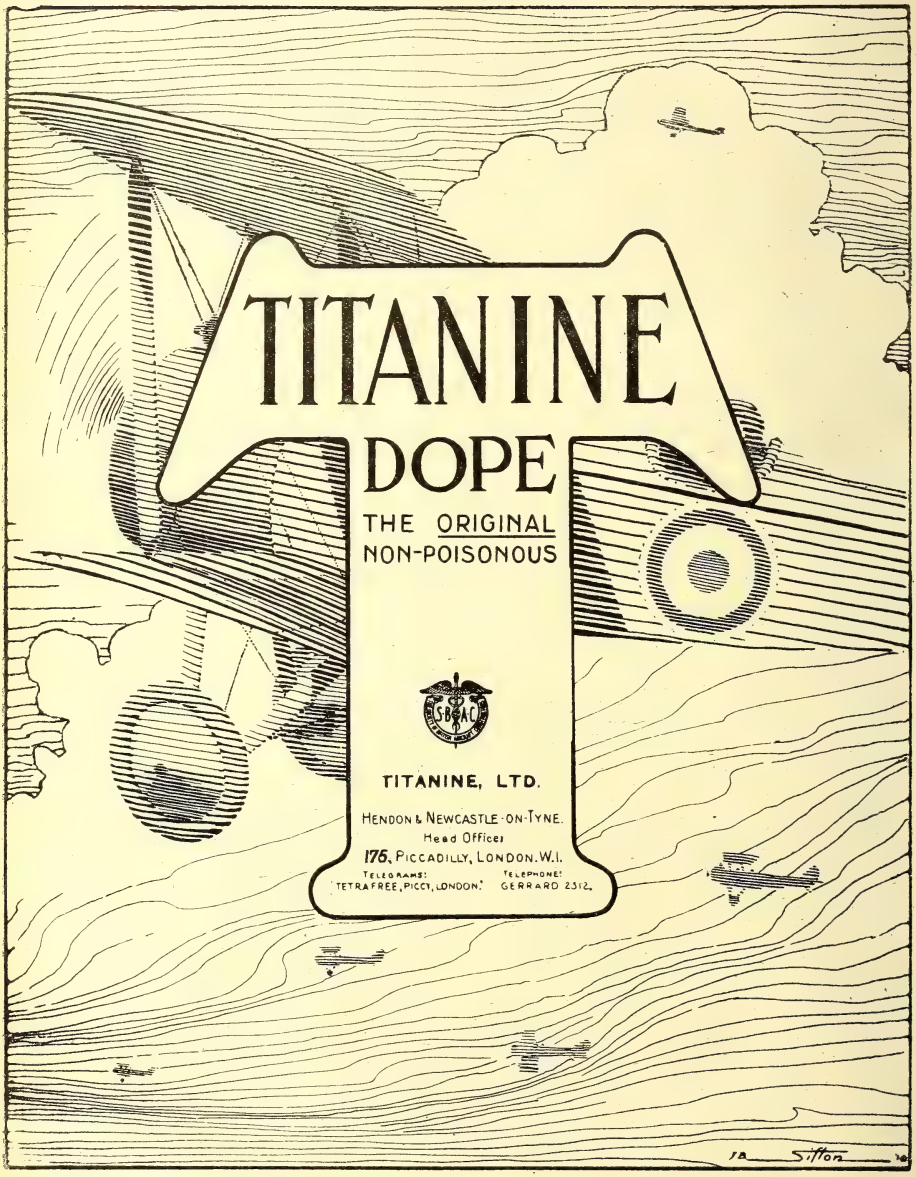
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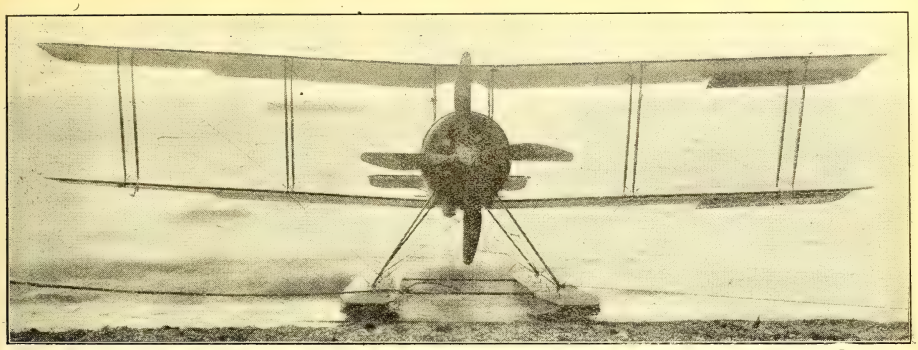
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The Avro Seaplane.—Front View.

Other details, flying instruments, lighting set, etc.	25
Total	325

Power Plant—	Centre.
Engine with magnetos (110 h.p. Le Rhône)	330
Airscrew, boss and bolts	41
Oil tanks, cooler and piping	15
Petrol tanks, piping and air pressure system	39
Total	425
Total weight of machine bare	1,231

Military Load—	
Crew of 2 at 180 lbs. each	360

Weight of Machine in Flying Trim.	
(a) Weight of machine bare	1,231
(b) Military load	360
(c) Petrol 25⅔ galls.	184
(d) Oil 6 galls.	54
Total	1,829

AREAS. Wings and Ailerons—

	sq. ft.
Top	173
Second	157
Total	330

Wing Flaps—	
Top	22.7
Second	22.7
Total	45.4
Tail plane	26
Elevators	18
Rudder	9

Dihedral—	
Top wing	2½°
Second wing	2½°

LOADING.

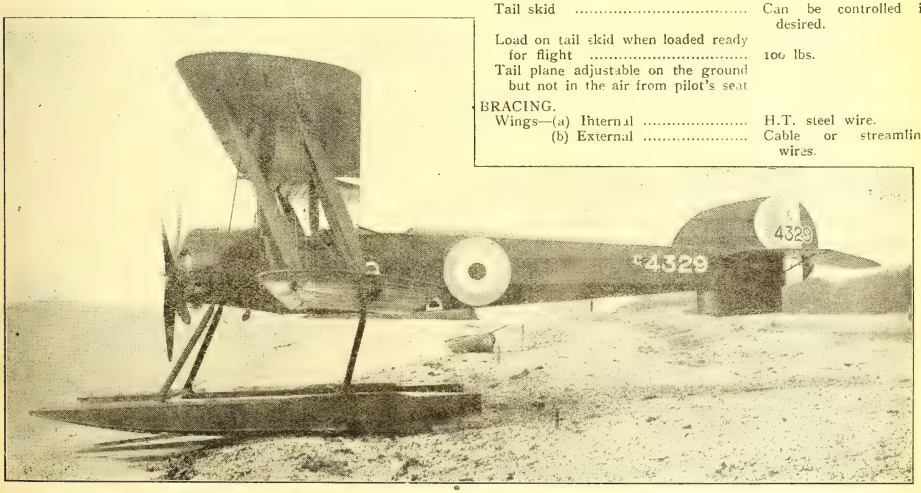
Loading on wing surface per sq. ft.	5.57 lbs.
Weight fully loaded per h.p. (nominal)	16.7 lbs.
Weight carried on tail in flight	Nil.
Movement of C. G. with total variation in load during flight	4.2 ins.

CONTROL.

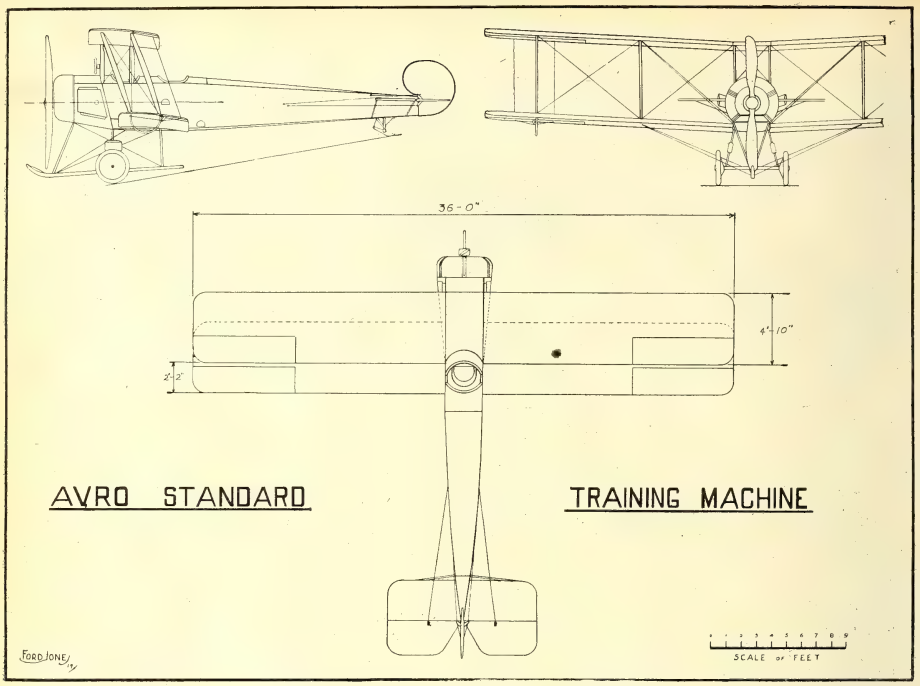
Type of aeroplane controls	Control pillars and foot bars.
Positions from which aeroplane may be controlled	Complete dual control.
What control provided for crew other than pilot	
Position of engine controls	On left-hand side of body.
No adjustment of rudder bar is provided	
Tail skid	Can be controlled if desired.
Load on tail skid when loaded ready for flight	100 lbs.
Tail plane adjustable on the ground but not in the air from pilot's seat	

BRACING.

Wings—(a) Internal	H.T. steel wire.
(b) External	Cable or streamline wires.



Side View of the Avro Seaplane. This Machine is the Standard Training Machine in all Essentials, Fitted with a Float Under-Carriage.



General Arrangement of the Standard Avro Type 504 K.

Body	H.T. steel wire.
Undercarriage	Cable.
Other parts	Wire and cable.
UNDERCARRIAGE.	
Type	Special "Avro."
Size of standard wheels fitted	100 mm. × 700 mm.
MATERIALS.	
Wing spars	Spruce.
Wing struts	Spruce.
Body struts	Spruce and ash
Undercarriage struts	Steel tubes.
Longerons in body	Ash.
Shock absorber	Rubber cord.

TANKS.

Petrol Position.	Pressure or Gravity.	Capacity (gallons)	Materials	Weight Empty.
(a) Behind engine.	Pressure.	21 galls.	Tinned steel.	27
(b) In centre section.	Gravity.	4½ galls.	Tinned steel.	10
Oil. Behind engine.	Gravity.	6 galls.	Tinned steel.	12

Factor of safety. Machine had a factor of safety of 7 on sand test.
Range of movement of centre of pressure .3 to .5 of Chord.

THE AVRO SEAPLANE, TYPE 504 L.

The Avro seaplane 504 L is practically the standard Avro 504 K land machine fitted with two pontoon single-step floats, which are attached to the fuselage by four struts as shown in the accompanying photographs. A small tail-float is also fitted direct to the fuselage.

The fairing of the sides of the fuselage has been improved so that the shape throughout now more or less conforms with the shape of the engine cowling.

The machine, as a two-seater, is fitted with dual control, but it is also being made as a three-seater, the pilot then being situated in front with single control.

It is arranged to take all rotary engines up to 150 h.p. and also the A.B.C. 175 h.p. "Wasp" radial engine, by means of an engine mounting designed to make adaptors for the various engines.

It can be looped, spun, side-slipped, stalled, etc., like the standard Avro 504 K. A speed of 90 m.p.h. was obtained with a 130 h.p. Clerget flying at sea-level.

(To be continued.)

THE DEVELOPMENT OF THE TAP.

By W. H. Smith.

To the average mind a tap is just an appliance to govern or stay the flow of gases and liquids at will. Such devices are known alternatively as cocks or valves and vary in design and construction according to the purpose for which they are intended. As an illustration of what is meant, less accuracy in construction is necessary in a tap for molasses or treacle than in a water tap for an equal degree of security from leakage. Perfect designs for both are matters of ancient history, but a perfect tap that will faithfully serve the same purpose in the case of petrol was not known until the great European War had demonstrated the acute necessity for such an article.

Petrol leakage in any circumstance is a source of serious danger; to the pilot it is one of the utmost peril. The consequent loss of spirit is an item to be reckoned with from an economic point of view, but the danger from fire outweighs everything else.

It has been said that in the early days of the war, seventy-five per cent. of the fires in the air were due to petrol leakages from taps of imperfect design. It is not possible to say how many brains were concentrated on this problem, but it can be stated that up to the present one perfect design only has been devised, and that the achievement is satisfactory from every point of view is confirmed by testimony from the Air Board, the leading aircraft constructors and by the experience of the Royal Air Force.

This achievement was not the result—as in many cases—of accident or good fortune, but the outcome of a firm determination to overcome the difficulty if it was humanly possible to do so. It was accomplished by a firm of engineers almost entirely engaged on the production of small component parts for aircraft and aircraft engines, after months of concentrated effort and experiment.

The knotty points to be unravelled embraced more than that of absolute tightness; instantaneous ease in working was essen-


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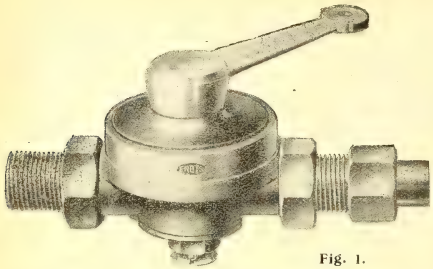


Fig. 1.

tial: sticking or seizing would be fatal, and slackening meant equally disastrous consequences. Moreover, it was not the mere weight or pressure of petrol alone that had to be considered, but the spirit under a forced pressure, the actual tests that each cock has to pass before acceptance being 15 lbs. per square inch.

Every possible combination and variation of the methods hitherto in use had to be rejected in turn as obviously useless, until at last it was seen that the use of one metal body against another was hopeless because the necessary lubricant was very quickly dissolved by the action of petrol.

In due course it was decided to try the interposition of a disc of cork between two metal surfaces, stationary and moveable respectively, and even the first and crudest experiments gave promise of ultimate success.

Difficulties are only created to be overcome; here

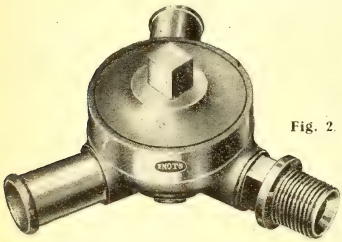


Fig. 2

they were numerous, but were vanquished one by one. The attachment of the cork seat to the metal base, the necessary provision for taking up slackness or possible wear, and absolute freedom or "sweetness" in working had always to be borne in mind as a sine qua non.

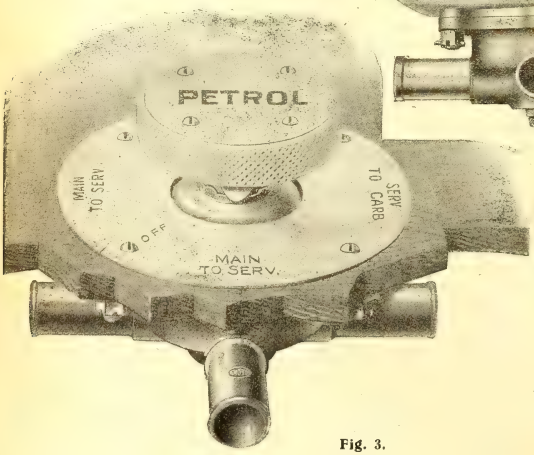


Fig. 3.

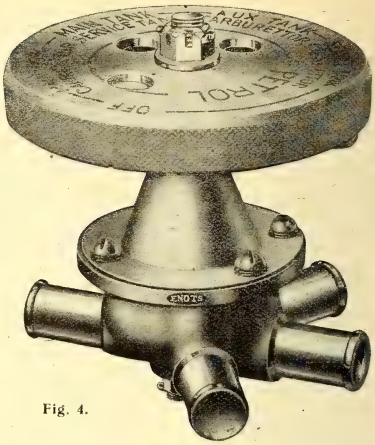


Fig. 4.

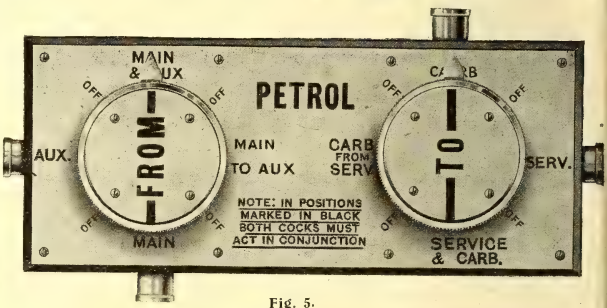


Fig. 5.

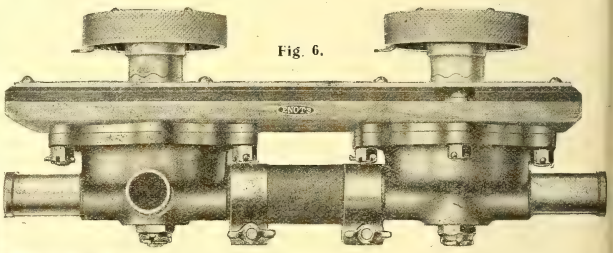
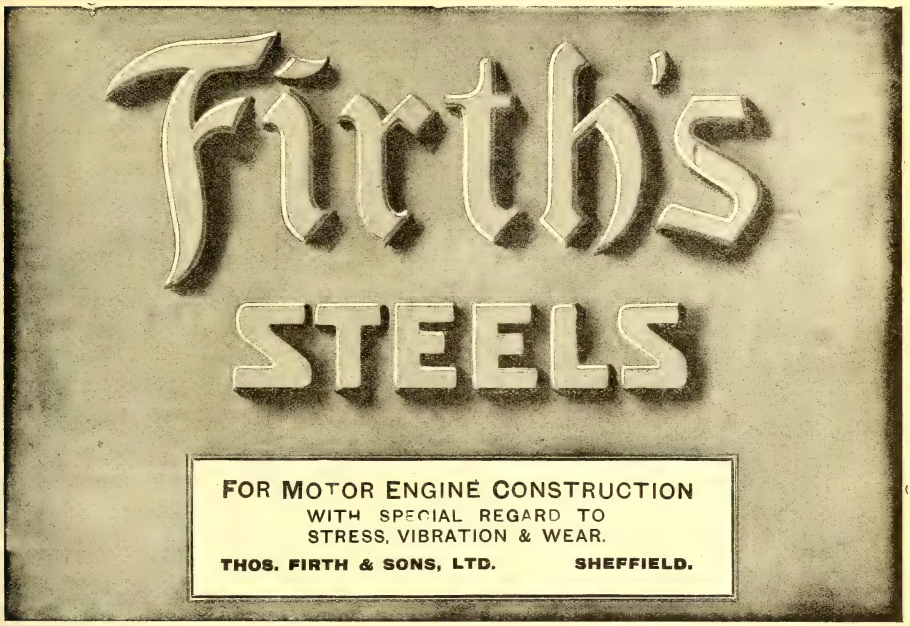


Fig. 6.

It was found that the cork employed must be free from fault or blemish in growth, also perfectly and accurately cut; this necessity alone was filled only after scouring the country. Most cork merchants could supply such materials in small quantities, but owing to shipping difficulties the co-operation of several sources of supply had to be requisitioned before the necessary quantities were available.

These and many other apparently trifling, but really vital, details being settled to the satisfaction of the originators, the Enots Cork Disc Seated Petrol Cock was protected and submitted to the Air Authorities and approved after exhaustive tests. Since then (February, 1916) the device has more than justified all that was claimed for it, and the simple "straight through" pattern became the parent of numerous others, more intricate than their forbear, but preserving in every instance the original simplicity of principle.



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Some idea of the developments in this invention that have taken place may be gathered from the accompanying illustrations. Fig. 1 shows the simplest pattern, or one-way cock; fig. 2, an elaboration of fig. 1, whereby the carburetter may be supplied from either of two tanks at will by a partial turn of the actuating lever. Fig. 3 shows a three-way cock with pointer and dial indicating the flow from main tanks to service tanks and from the latter to the carburetter. Fig. 4 shows a still more elaborate arrangement embracing petrol connections in five different ways, in addition to the "off" position, either being attained by a partial turn of the wheel handle. Figs. 5 and 6 show respectively plan and elevation of a dial or twin arrangement of cocks, the purposes of which are self explained by the illustrations. Fig. 7 shows a four-way petrol cock with an air cock attachment for the regulation of petrol supply and air pressure in six different directions coincidentally.

These seven figures are taken from a 30-page illustrated catalogue describing the taps forming the subject of this article and other Aircraft Component parts, such as air valves, petrol filters, petrol fillers, pressure pumps, flanges, unions, nuts, nipples, elbows, tee pieces, etc., etc. The list should prove of interest to many readers associated with the Aircraft Industry, and will be sent to bona fide inquirers post free on application to Benton and Stone, Limited, Enots Works, Birmingham, the manufacturers and sole patentees of the Cork Disc Seated Taps.

Over 120,000 of these petrol taps have been made at Enots Works alone; further quantities have been produced under licence by several other houses, and all have been used exclusively on British and Allied aircraft.

It may be interesting to note that Benton and Stone were manufacturing Aircraft Component parts for some considerable time before the outbreak of war. A reputation for high-grade products in connection with internal combustion engines made to fine limits naturally brought inquiries from aircraft builders, so that when the great necessity arose the firm had already gained much valuable experience. During the period covered by actual hostilities the output of aircraft parts approached 7,000,000 pieces, in addition to great quantities of fuse, shell, motor transport and similar work.

Owing to the extraordinary demand for use on aircraft it has not been possible to produce the Cork Disc Seated Taps for other purposes until now, but several patterns designed for use on motor vehicles generally will be put on the market almost at once, and the invention has great possibilities in other directions. In one instance, at least, it has proved to act perfectly in controlling a vacuum where every other type of cock had failed.

So far there is no record of any complaint as to the satisfactory working and performance of this tap. On the other hand, unqualified expressions of approval have been received from the Controller, Aircraft Production Supplies Dept., The National Aeroplane Factory, Messrs. Handley Page, Ltd., The Grahame-White Aviation Co., Ltd., Hewlett and Blondeau, Ltd., A. V. Roe and Co., Ltd., Austin Motor Co., Ltd., William Beardmore and Co., Ltd., Vickers, Ltd., Sunbeam Motor Car Co., Ltd., Brush Electrical Engineering Co., Ltd., Humber, Ltd., Harland and Wolff, Ltd., Morgan and Co., Ltd., and many others.

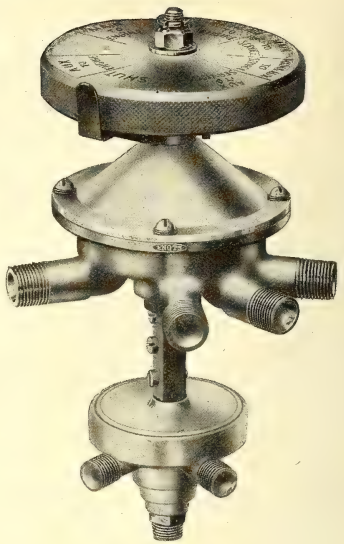


Fig. 7.

STANDARDISATION OF AIRCRAFT MATERIALS AND PARTS.

It will be recalled that during the past year and a half the British Engineering Standards Association has been responsible for the preparation of all specifications for aircraft materials on behalf of the Department of Aircraft Production. During this period some 70 British standard specifications for aircraft materials were issued, and a further 60 were practically complete at the time of the cessation of hostilities.

These specifications were distributed to the makers by the Department, as the whole of the aircraft production of this country was under its control. These conditions are now changing, and at the request of the Air Ministry and the Department of Aircraft Production, and with the cordial support of the Society of British Aircraft Constructors and the Steel Research Committee and other associations, the British Engineering Standards Association have been requested to continue the preparation of specifications for aircraft materials and parts, as well as undertake their distribution, together with the issue of manufacturing instructions and notes on testing procedure which were formerly prepared and issued by the Technical and Inspection Departments of the Department of Aircraft Production. This request was considered at a recent meeting of the Sectional Aircraft Committee of the British Engineering Standards Association, and, with the approval of the Main Standards Committee, the Association has undertaken this additional responsibility as from March 31st, 1919.

It is proposed to reorganise on a peace basis the various sub-committees concerned with the preparation of these specifications. These sub-committees when reorganised will undertake the revision of the specifications for peace purposes. In the meantime the whole of the 200 specifications in use by the Department of Aircraft Production have for immediate purposes been adopted as interim British standards.

During the war a large number of firms were engaged in the manufacture of aircraft materials and parts, but are now returning to their former occupations, and arrangements for the distribution of these specifications which have been in force during the past year will not apply in the future.

It is not proposed to circulate copies of all specifications to every maker concerned with the production of aircraft materials, but to ask the makers to indicate which they are interested in. A complete list of the specifications now available will shortly be circulated to the 2,000 contractors on the former despatching list with the request that they indicate the specifications they desire copies of. It is recommended that a small charge should be made per copy to cover the cost of printing. The charge will probably be 1½d. per copy for those specifications issued in leaflet form, and 1s. for those specifications issued in the ordinary British Standard octavo book form. This arrangement is, however, provisional.

There can be little doubt that the preparation of specifications by the British Engineering Standards Association in the manner adopted whereby manufacturers and users, together with technical officers of the Government Departments interested, as well as experts from research laboratories and colleges and consultants, co-operate in their production, coupled with the principle of not issuing a British standard specification until practical agreement has been reached, is very sound, and a wide use of these specifications for all aircraft production may confidently be expected.

It is interesting to note that specifications dealing with materials which formerly were perhaps not considered as being of an engineering nature have been prepared, such as chemicals, textiles, paints and varnishes.

THE AMERICAN VIEW.

An American friend of The Aeroplane writes:—

"We have just gotten through with our Aeronautic Exposition, and it proved to be quite interesting from the standpoint of showing the American people what had been done during the war period. The time was too brief to give the manufacturers an opportunity of giving the public a forward look into the possibilities of aerial transportation, but it did, without doubt, interest them hugely, and I think most were satisfied.

"If the newspaper comments are correct, you are doing much more constructive work in England to maintain and sustain interest in aviation than we are here, but there is every possibility that when Congress meets in extra session, towards the end of May, as it will, undoubtedly, we will have an opportunity of putting up a strong argument for an Air Department with proper line to international improvement.

"As you know, the Republicans will control the House and Senate, and hitherto have shown themselves a little more alert in recognising the opportunities along lines of this character."



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PATENTS INDEX.

The subjoined list of recent inventions has been specially compiled by The Aeroplane from the current Official Patents Records :—

Patents Applications.

Akt Norske Aerofilk; C. Hellesen. Flying-machines. No. 8579. April 4th.
Atcherley, R. H. Thin-metal aerofoil ribs. No. 8354. April 2nd.
Blackburn, H. Body harness for supporting passengers from parachutes or marine life-saving apparatus, etc. No. 8294. April 2nd.
Carden, C. E. Wind-screen for observation windows of vehicles and aircraft. No. 8229. April 2nd.
Fisher, H. F. Parachutes. No. 8636. April 5th.
Haigh, J. S. Petrol tanks for motor-cars, aircraft, etc. No 8588. April 5th.
Huxley, M. F. Radiators for aircraft, motor vehicles, etc. No. 8615. April 5th.
Ireland, A. J. T. Airscrews. No. 8564. April 4th.
Leigh, A. G. Aeroplanes. No. 8197. April 1st.
Mable, R. I. Straining-device for wires, cables, etc., of aircraft, etc. No. 8020. March 31st.
Marrice, W. K. F. Means for navigating aircraft. No. 8234. April 2nd.
Morgan, E. T. Aircraft landing-chassis. No. 8166. April 1st.
Pearson, C Aeroplanes. No. 8523. April 4th.
Roach, B. Toy aeroplane kite. No. 8247. April 2nd
Scaparro, E. Mechanical aircraft parachute. No. 8143. April 1st.
Sheppard, W.S. Aircraft. No. 8474. April 4th.
Simpson, C. E. H. Hydro-airship. No. 8370. April 3rd.
Supermarine Aviation Works. Tail-planes, etc, for aircraft. No. 8346. April 2nd.
Vickers, Ltd. Aeroplane, etc., wings. No. 8325. April 2nd.
Worman, W. M. Collapsible aeroplane undercarriage or chassis No. 8353. April 2nd.

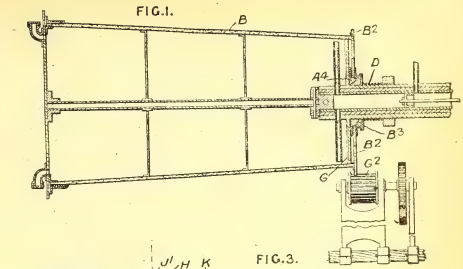
Complete Specifications Accepted, prints of which can be Obtained on and after April 24th, 1919.

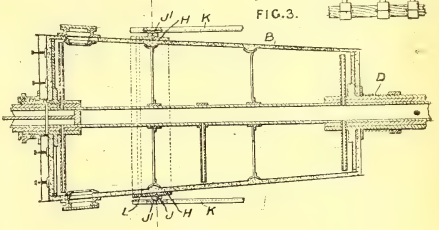
124,459. Jan. 5th, 1916. Pennington, L. T. M. Firing-devices of bombs, shells, and other projectiles.
124,466. Jan. 13th, 1916. McCartney, W. C., and Redpath, R. Means for calculating the range and height of aircraft.
124,479. Jan. 25th, 1916. Pelterie, R. Esnault. Sighting-devices used in the dropping of bombs from aboard a dirigible for an aeroplane.
124,482. Jan. 24th, 1916. Vickers, Ltd., and Pierson, R. K. Control members of aircraft.
124,486. Jan. 27th, 1916. Vickers, Ltd., Challenger, G. H., and Savage, H. A. Aircraft.
124,501. Feb. 14th, 1916. Vickers, Ltd., and Challenger, G. H. Mounting for guns carried by aeroplanes and similar aircraft.
124,508. Feb. 19th, 1916. Sueter, M. F., and Ritchie, T. M. Construction of airship envelopes, balloons, and the like.
124,509. Feb. 19th, 1916. Vickers, Ltd., Challenger, G. H., and Savage, H. A. Aircraft.
124,517. March 1st, 1916. Sage and Co., F., and Feary, N. A. T. N. Hydro-aeroplane floats.
124,520. March 3rd, 1916. Glazebrook, R. T., Rouse, W. M., and Johnston, A. Fabrics used in the manufacture of balloons and dirigible airships.
124,524. March 7th, 1916. Miller, C W. T., and Hurst, J. Gun mountings for aeroplanes.
124,531. Sept. 3rd, 1917. Friend, E. H. Rotary engine.
124,536. Dec. 29th, 1917. Goddevriendt, L., and Goddevriendt, A. Clinometer for use on aircraft, ships and the like.
124,547. March 14th, 1918. Brown, D. E. Hydro-aeroplanes.
124,572. March 27th, 1918. Kitchen, J. G. A. Means for varying the speed and stopping way of aircraft without slowing the propeller.
124,606. April 15th, 1918. Kemp, J. R. Level-indicator or clinometer for aircraft.
124,607. April 15th 1918. Hetherington, H. W. Flying-machines.
124,643. June 8th, 1918. Lees and Co., A., and Dunkerley, L Cutters for use in machines for forming aircraft propeller blades, struts, and like articles having curved or waved or similar surfaces.
124,677. Oct 7th, 1918. Baker, F. Parachutes.

Abridgments of Recently Published Specifications.

121,513. Tanks. Thompson, A. D., Hill Crest, Merry Hill, Bushey, Hertfordshire.

Petrol and other tanks for aircraft, of the kind described in Specification 17511/15, are provided with means for automatically rotating the cover B, Fig. 1, when the tank is pierced, or with improved means for rotating the cover by hand. The automatic means comprises a plunger G operated by a variation of pressure due to the entry of a projectile and controlling electric or mechanical means for rotating the cover through gearing G^2, B^2. If the tank and cover are tapered, the cover is simultaneously moved longitudinally against the action of a spring D

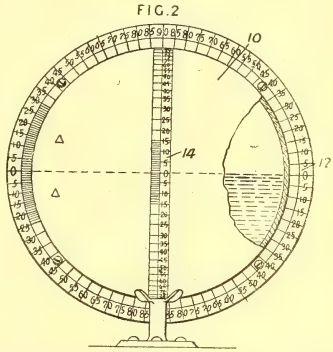




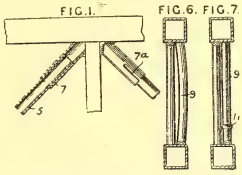
by means of ratchet-wheels B^3, A^4 on the cover and tank respectively. The cover may be longitudinally displaced and rotated by hand-operated means comprising a ratchet ring H, Fig. 3, fixed to the cover, blocks J carrying pawls J^1 and engaging spirally grooved members K, and a loose ring L fitted in a groove in the ring H and connected to an operating lever. The packing between the tank and cover may consist of layers of felt or other soft material with an interposed layer of rubber.

121,661. Inclinometers for aircraft. Marshall, J. E., Caney, Kansas, U.S.A.

The instrument consists of a transparent sphere 10 half filled with liquid, provided with graduations 14 and encircled by a graduated plate 12, which is arranged at right-angles to the plane of the graduations 14 and is bolted to lugs projecting from the sphere.



121,968. Aeronautics; buildings, etc. Rapp, J. W., College Point, New York, U.S.A.



Frames or structures, such as are used in aeroplanes, are tensioned by members secured to the frame, etc., heated to elongate and telescope them, and then welded together while heated. In one form, Fig. 1, the member 5 is heated and then welded to sleeves 7 which are secured to the frame and have slots 7a to permit a secure weld. In a modification, the member 9, Fig. 6, secured at both ends to the frame, is heated and is melted at a point to allow the part 9 to straighten, forming a bulging joint 11, Fig. 7. The surplus metal at the joint is then removed.

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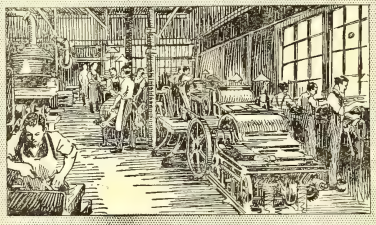
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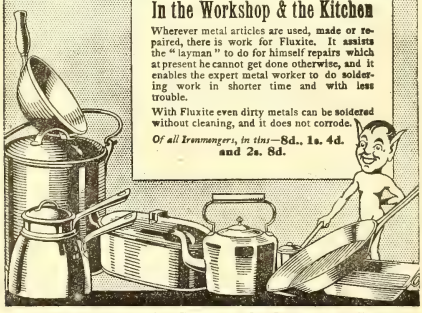
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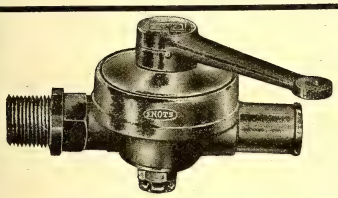
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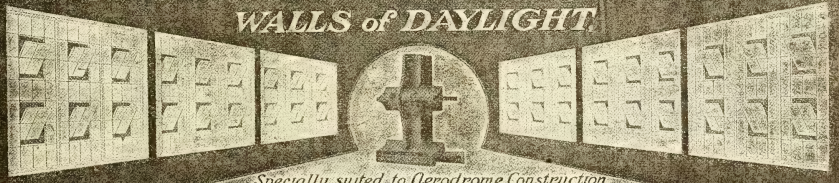
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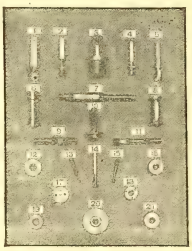
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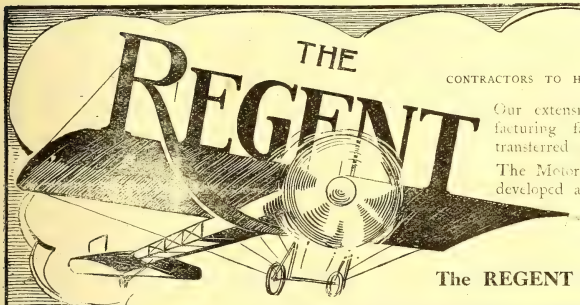
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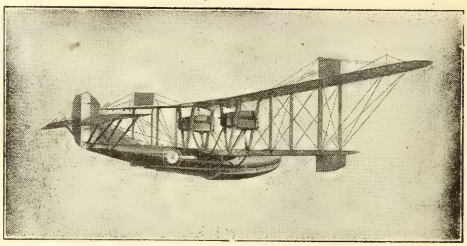
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COMMERCIAL AERONAUTICS & CIVIL AERIAL TRANSPORT

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By "Medway."

There was published recently in the "Times" a lengthy article on the intentions of the Air Ministry. Judging solely by internal evidence, and particularly by the obvious belief of the writer that everything is for the best in the best of all possible Government Departments, I take it that this article must have been compiled by an official of the Ministry itself.

In an attempt to arrive at a more exact conclusion as to its origin, I find myself divided between two alternatives. Either it was put together by some quondam officer of the R.A.F. whose skill is capable of better illustration in the air than on paper, or else it is the work of the "Man behind the Scenes."

The Man Behind the Scenes.

This gentleman presumably figures on the staff of every Ministry. His job is to answer questions addressed to the Minister by inquiring members of the House of Commons. A Minister is, of course, supposed to be omniscient on all matters coming even remotely within the purview of his Department, but as he has probably attained his position by a serious of quick-change feats, in the course of which he has run rapidly over agriculture, education, the Army, the Colonies, the Local Government Board, and one or two other Departments, and has probably only held his present position for about three weeks, it stands to reason that his proper answer to ninety-nine questions out of a hundred would be, "I haven't the slightest idea and, in fact, I don't know what you are talking about."

It is to avoid the necessity for the perpetual repetition of this reply that the "Man behind the Scenes" is employed. He is an official of much learning, with an admirable knowledge of the classics and of higher mathematics developed in his early years. Now he is mainly employed in filling in time and seeing that the Minister says or does nothing indiscreet, or at least nothing more than usually flagrant.

The Art of Evading Questions.

His great game is to put things in an oracular manner, so that they can be read in about five different ways. He does not so much answer questions as evade them. His style appears to me to peep out through the paragraphs of the article to which I have referred. Take, for instance, the following:—

"Flying is to be divided definitely under two heads, of which one will be State flying and the other commercial flying. Under the first it is proposed to place all work that is in any way connected with the three Services, with the Customs, and with the Police. Under the second will be found all other forms of flying.

"As flying develops so will the activities of the Ministry. There will be more and more phases of service in which it can be useful, such as survey work and the transport of bullion. When the Post Office has decided that the time has come for the delivery of mails by aeroplane, it will approach the Ministry, and tenders will be asked for. The selection of the machines for the service will be made, and it will be run by the State.

"Meanwhile, if the Ministry is unable to produce from elsewhere machines and pilots for the work required to be done by the Post Office, it will be possible to draw on the Royal Air Force. But that is a consideration only to be entertained while the supply of commercial machines is limited."

Now, what on earth does all this mean. The first sentence is plain enough. State flying will be entirely separated from commercial flying. This is a statement of a policy likely to lead to a good deal of argument and criticism. I will go back to it later. Meanwhile, our friend feels that he must define State flying, which he proceeds to do. Aerial mail services are not included in it. Then he goes on to tell us that aerial mail services will be run by the State, using machines selected by the Ministry, handled by pilots produced by the Ministry. Military machines may be employed. On the other hand, they may not.

Now, in the light of all this information, is an aerial mail service State flying, or is it not? If it is commercial flying, where does the commercial side of the business come in?

The system of contracting such as is employed when the Post Office wants the use of the motor mail services cannot be in contemplation, because there is nothing left for the contractor to do if the State provides and runs the machines. Apparently, however, the machines are to be of the commercial variety if possible. They will therefore come under commercial flying. Presumably, the pilots "produced from elsewhere" will also be commercial pilots.

State Flying and Commercial Flying.

We, therefore, have State enterprise employing commercial personnel and material. How on earth, then, can we definitely divide State flying from commercial flying? The gentleman who tells us that it is proposed to do so supplies us with the best possible instance to prove that the thing cannot be done.

He does not go on to prove that it is not desirable to attempt to do it, but this seems to me to be easily demonstrable. There is no conceivable reason why the carriage of mails, which, let us remember, "will be run by the State," should be divided definitely from the carriage of passengers, which is clearly a commercial undertaking, unless we start by indulging in the present-day mania for nationalising everything. This we are distinctly told is not intended.

One can imagine that a demand will be created for the carriage of passengers and of mails between London and Paris. What possible purpose would be served by leaving the one to private enterprise and putting the other under the wing of the State? The consequence would be that the expense of two services would be incurred where one would have served the purpose. The passenger service would stand so much the worse chance of being a success, inasmuch as it would not get the regular revenue of an authorised mail carrier.

Obviously passenger and mail work must go hand in hand.

Useful Work for Service Pilots.

Moreover, if Service pilots are to be established in military depôts, at various points throughout the Empire, and if these pilots are to keep in practice, they must obviously do a certain amount of work in the air. Why should we divide them rigidly from all connection with commercial flying? Why should they not be given their practice by being allotted useful work to do? Why should not the whole ground organisation created in their support be continually tested and kept tuned up by being called upon to assist them in doing this useful work?

There seems to be a sort of trade union "One man one job" idea at the back of the scheme. If a man is a Service pilot, he cannot be a commercial pilot, although a commercial pilot, we are told, will be on the Reserve of the R.A.F. In peace-time the average soldier does something under half an hour of useful work in the day. Is the Service pilot to be condemned to a life of similar useless inactivity? If he is allowed to be active, why not let his activity be useful?

In fine, then, I am entirely up against this theory of definitely dividing flying into two heads—State flying and commercial flying. It is exactly the one thing above all others that we want to avoid. My chief hope lies in the obvious and fearful muddle into which the exponent of the theory immediately falls when he attempts to explain how it will work out in practice. His failure should be sufficient to convince those concerned that a principle, the working of which cannot even be explained, had better be abandoned before we reach the stage of its practical application.

POST-BELLUM POLICIES.

By The Special Commissioner of "The Aeroplane."

MR. A. V. ROE (A. V. Roe and Co., Ltd.).

The Avro Firm are, I believe, in a unique position, their standard Avro being recognised and used as the initial training machine of the R.A.F., and from opinions I have gathered from instructional officers in that Force, it does not seem likely to be displaced, at any rate unless the present methods of training are altered.

This is, of course, a possibility, as war necessities call for methods that are not always either approved or applied in peace time; but now when the longer time available for training pilots brings forth other theories and causes their adoption in school work, it is probable that this machine will continue as one of the most important instructional types.

The Standard Avro.

With this apparently assured consumption, demand for their machines, and the consequent income, the firm might be satisfied and it does not appear that in the near future they intend to do other than continue the construction of the standard model, and in the following forms:—

1. The standard Avro.
2. The same machine fitted with covered limousine body to carry two passengers as well as pilot.
3. Still the same fitted with floats. In this, elderly people will be able to take lessons with plenty of room for manœuvring and landing. This type of machine should prove very popular where stretches of water exist (it is conceivable that it might be far otherwise where they don't), and can be used for postal and general utility work as well as pleasure.

In the future, I am told, the firm will continue to produce and to improve on the standard Avro, in the above various forms. I cannot, however, forget that 4½ years have already passed since the original, and it seems, almost identical design was produced. Further: "We have other types ready for production, and, in addition, we shall continue experimental work with a view to excelling in the design of any particular type of machine we think will be in large demand."

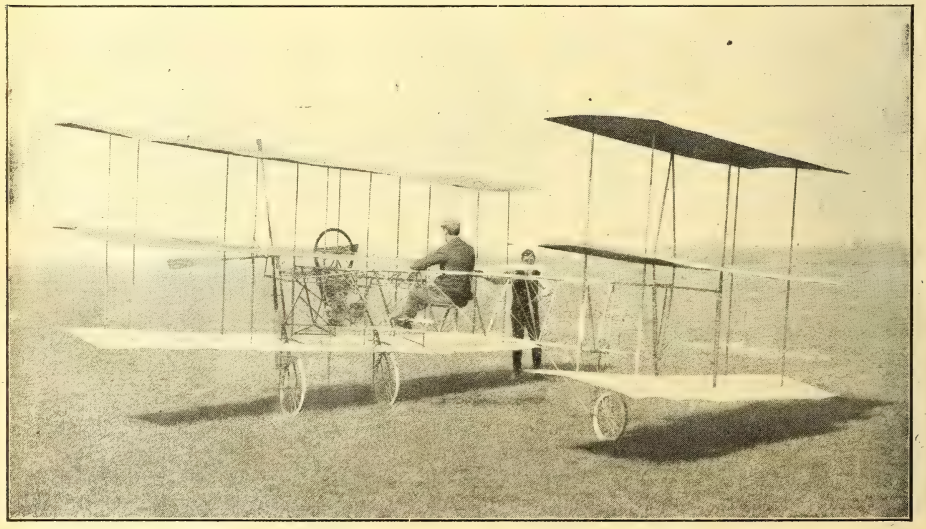
Here is a declaration of the waiting policy, waiting to be led by public opinion, and, unless the firm has something up its sleeve, it is not attempting either to create or foresee the desires of the public in the future, though I am assured that it is intended to provide machines for the individual public.

Economy.

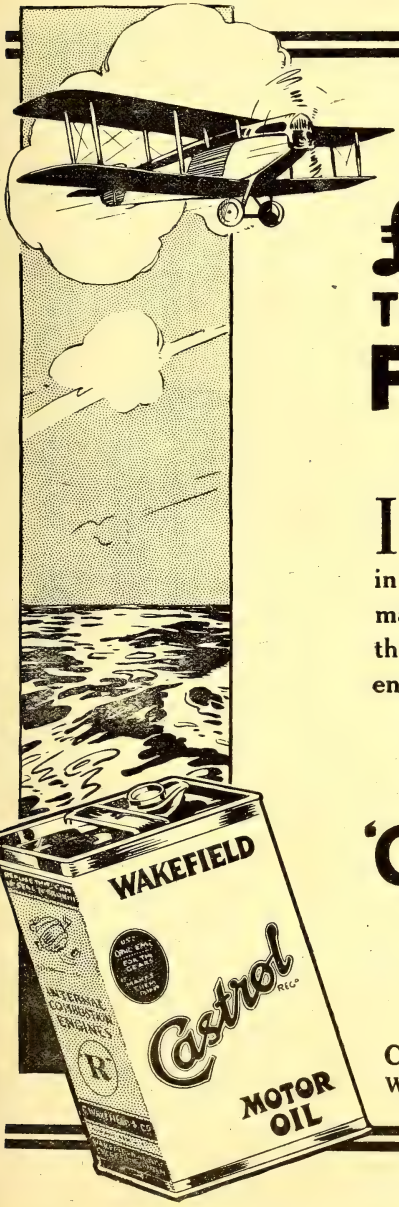
The Avro Firm, in common with others, are fully alive to the importance of economy in the air, and point out that the life of a machine compares very favourably with a car on the mileage basis, quoting instances of their machines with six or seven hundred hours' flying to their credit.

The Future of the Aeroplane.

Now, concerning the future of the flying machine, Mr. A. V. Roe says: "Improvements will continue for many years, not only



The A. V. Roe Triplane with 9-h.p. J.A.P. Engine, 1909.



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in machines themselves, but in the method of construction. The power plant in large machines will be so arranged that the likelihood of propulsion stoppage will be very remote. Large flying-boats capable of alighting on and getting off rough seas will be developed.

Internal combustion engines will continue to be improved, and possibly steam, generated by crude oil, may play an important part in the future."

THE STEAM ENGINE IN AERONAUTICS.

Mr. Roe's hint to the manufacturers of steam engines and boilers is extremely interesting. I do not think any of these have ever aimed at lightness in design so much as compactness, and the possibility of the use of steam has been more or less ridiculed since the later development of the petrol engine.

Although I am convinced many people will disagree with me, more especially those in the motor business, the steam engine has always been more reliable than the petrol motor. Whether it would continue to be with the weight reductions necessary to bring such an engine within the aeronautical range remains to be proved. It has, moreover, one great advantage, that is, you cannot damage a turbine by over-reving it, but the idea, with all its attendant possibilities, is fascinating. Just think of being told to "raise steam with all dispatch in No. 5 machine, two boilers only will be required." Seriously, however, it might possibly lead to greatly reduced running costs.

In Mr. Roe, too, we have another advocate for the seaplane. It will be of interest to see if Aerial Transport companies do not combine both types when they select their stock, or whether there will be separate concerns operating the two types, as I do not believe the general public has nearly so much knowledge of the possibilities of the latter.

Mr. Roe says that the firm intends to build competition machines but not "freaks, and wait for a low barometer to record climbs."

This is very non-committal, but, of course, it is very difficult to draw the line between saying too little and too much, especially when there is keen rivalry in the business. It must not be forgotten that Mr. Roe takes a very keen interest in his staff, as evidenced by his arrangements for their benefit, arrangements which should ensure loyalty even in these times of labour unrest, and that very large sums have been spent by the firm on experimental work, so that, although Mr. Roe is reticent, it is probable that new Avros will be forthcoming. I cannot imagine his inventive genius being other than fruitful. As an instance of which there is the Avro 2-engine "Pike," which, I am reasonably sure, although relying on memory, put up a better performance than other "twin" contemporaries when fitted with the same engines.

Mr. Roe's idea of the future pilot is that he will, generally speaking, hold a position analogous to that of a captain of a ship, but qualifies it by saying that "it depends on the machine and machines he flies, and the person or firm for whom he flies, and the pilot himself."

A POST-BELLUM CATALOGUE.

The Grahame-White Company, Ltd., have produced a very elaborate preliminary catalogue which will be found attractive by those who are interested in prophetic illustrations. The machines shown are as follows:—

(1) An instructional machine on sound conventional lines, which the makers hope to sell with an 80 h.p. Le Rhône at £1,000.

(2) A sporting single-seater which is called "The Bantam." One was under the impression that the name "Bantam" had already been adopted by the B.A.T. Co. However, the Grahame-White Co. nope to sell this at £500 with an 80 h.p. engine.

(3) An express "Air-mail" machine in which, with a 270 h.p engine, the makers aim at a speed of 170 m.p.h. The main plane is to have a hinged trailing edge on lines which have already been proved successful on seaplanes by Mr. C. R. Fairey, so as to give it a slow landing speed. The makers hope to be able to sell it at £1,400—though this seems unlikely, unless the engine-makers reduce their prices below the present price of approximately £5 per h.p.

(4) A twin-engined aero "limousine" on good conventional lines with two 270 h.p. Rolls-Royces, and an estimated speed of 110 m.p.h. It is hoped to sell this at about £5,000.

(5) A five-seater limousine with the same power but slower speed, at a hoped-for £5,000 to £6,000.

(6) A 24-seater passenger triplane with three engines. This is somewhat on the lines of a Caproni, having a central nacelle with an 800 h.p. pusher engine astern and two fuselages. It differs from the Caproni in that the same nacelle is to carry two other engines of 500 h.p. each, arranged transversely, and driving a tractor screw through shafting and gears. These screws are to be outside the two fuselages, not carried on the fuselages as in the Caproni. The makers hope to sell this machine at approximately £20,000.

(7) A large flying-boat of the conventional type, to be fitted with two 350 h.p. Rolls-Royce engines. This is estimated to have a speed of 85 m.p.h., and to be sold at about £10,000.

The general scheme is finely ambitious, and one sincerely hopes that Commercial Aeronautics may develop in such a way as to fulfil the expectations of the compilers of the catalogue.

The Grahame-White Company state that as a special offer and to encourage flying as a sport, they are prepared to sell their first ten "Bantams" at 500 guineas apiece.

A.G.S. MANUFACTURERS ASSOCIATION

To the Editor of THE AEROPLANE.

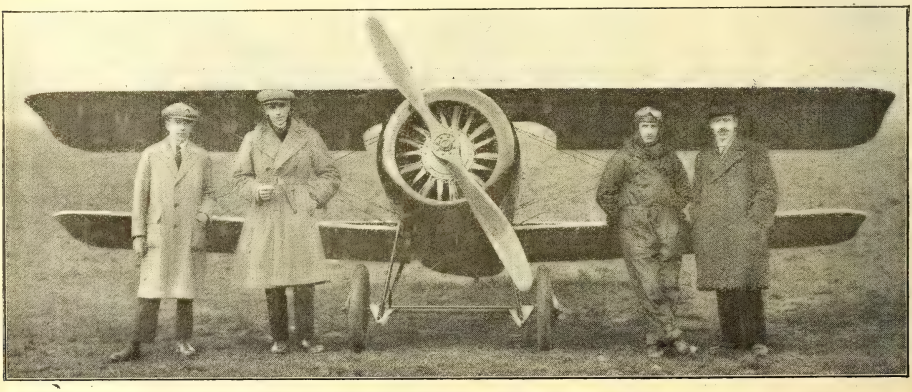
Sir,—The letter signed by Mr. Mansfield, published in your issue dated 9th inst., on the subject of Small Parts Makers is most interesting. However, Mr. Mansfield cannot be a reader of your paper or he would know of the formation of an Association to look after the interests of the Small Parts Makers.

The A.G.S. Manufacturers have been so completely left out in the cold by the S.B.A.C. (until this Association was formed) that "The A.G.S. Manufacturers' Association" has been started to deal with all matters of interest to Part Manufacturers.

If the S.B.A.C. does form such a section my Committee will be most pleased to advise them, as we are all working for the same end—the good of the trade.

I am certainly with Mr. Mansfield in his belief in the progress of Civil Aviation and join with him in advising all A.G.S. makers to become members of either this Association, which is dealing solely with their interests, or the S.B.A.C. Now is the time, when we are changing from abnormal conditions to a commercial proposition, to get matters put on a sound basis, and that can only be done by such a body; spasmodic individual efforts only tend to make things worse confounded.

GREY MCCANN, Secretary, A.G.S. Mfctrs. Assoc.



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CIVIL AERIAL TRANSPORT NOTES.

United Kingdom.

When civil aviation is made legal on May 1st, Harrods Ltd. intend starting a London-Paris aeroplane service. It will be used for conveying the firm's buyers to and fro, and also for fetching hats, gowns, and any other articles which are needed urgently.

Australia.

According to a Reuter message from Melbourne dated April 12th the Federal Government has agreed to the registration of a company which is to be formed to undertake the conveyance by air of mails, cargo, and passengers between the various Australian State Capitals.

Canada.

The Government of Canada has purchased a number of aeroplanes with a view to developing aerial navigation in the Dominion.

It was stated on April 19th that the Canadian Pacific Railway Company will apply to Parliament for authority to establish air services between points within or without Canada.

France.

The postal Bréguet aeroplane, which did service between Strasbourg and Paris, overturned at a forced landing near St. Dizier on April 18th.

The pilot was killed, and of the two passengers, one died from his injuries. The machine and mail were destroyed by fire.

Germany.

A third official aerial mail service, between Berlin, Hanover, and Westphalia has been established recently.

According to a Berlin correspondent's message published in the "Daily Express," Germany's commercial activity in the air is considerable. He writes:—

"On the ruins of Germany's battered railroad communications has arisen what probably is the most perfect aeroplane system in the world, and at the rate it is progressing it seems likely that when Germany is in a position to replace her lost rolling stock her railroads will scan the market in vain for passengers, and have to be content with hauling freight.

"A regular passenger air service between Berlin and Hamburg was the first instituted. Now there are six regular aeroplane routes in Germany, with daily trips both ways, and many more are being organised.

"For some weeks the Berlin-Hamburg route was the only line in operation.

"The experiment was so successful that Leipzig, in the south, Hanover and Gelsenkirchen, in the west, and Warnemuende, in the north, were added to the list of routes. A line, Berlin—Frankfort-on-the-Main, is about to be established. Berlin—Munich will be added to the schedule early this summer. These routes cover a total distance of 1,300 miles. The fare averages four shillings per mile.

'If a Berliner wants to take the three o'clock plane for Leipzig, he simply calls up the aeroplane company and orders a ticket. About half an hour before departure a chauffeur toots a limousine horn in front of the traveller's residence. At the aerodrome an agent is on hand with his ticket and special accident policy—that is, if he had the foresight to order insurance with his ticket.

"An attendant helps the passenger into the flying suit. An hour later the Berliner steps out of the aeroplane at the Leipzig aerodrome, where another motor-car is waiting to take him to his destination in the city.

"I was shown a prospectus of new aeroplane routes contemplated by the aeroplane company this year. With Berlin as the centre, they cover all Germany."

Italy.

"If a Berliner wants to take the three o'clock plane for Leip- aircraft manufacturers has received an order for the construction of a large aeroplane, which will be capable of carrying 100 passengers. The machine will be provided with every possible comfort.

Sweden.

It is reported from Landskrona, on April 14th, in South Sweden, that at a shareholders' meeting of Thulin's aeroplane factory, the largest establishment of its kind in Sweden, it was decided to discontinue making aeroplanes, and to concentrate activity in future on the manufacture of motors and motor vehicles.

Belgium.

M. Rankin, Minister of Belgian Railways, Post, and Telegraphs, on Sunday, April 13th, flew from Brussels to London in a twin-engined Handley Page machine which had been converted for passenger use. The journey, which occupied over four hours, was accomplished in spite of a strong wind, and unfavourable conditions.

"THE AEROPLANE" AND INSURANCE BUSINESS.

Various worthy people have suggested that THE AEROPLANE should adopt some Scheme of Insurance for aviators and their passengers and aircraft generally, similar to the various Insurance Schemes which are run by papers of all kinds. Very tempting propositions of this nature have been offered to THE AEROPLANE, but it has been definitely decided to have nothing whatever to do with Insurance as a business proposition.

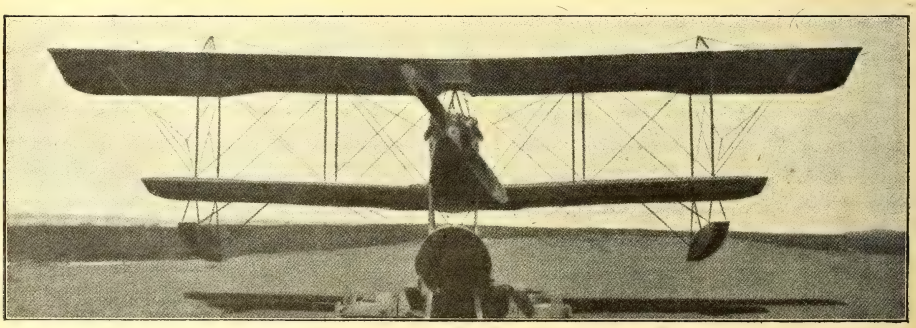
One holds firmly to the belief that a newspaper should have no financial interests whatever in any business except its own particular concern as printers, publishers and purveyors of news and opinions.

If a paper is to retain its independence and is to do its duty by the particular service, sport and/or industry which it serves, it must be absolutely free from any business tie of any kind which may conflict with that duty.

It has been proposed on occasion that THE AEROPLANE should become the official organ of this, that, or the other Association, Society or Club, and in every case these propositions have been turned down, because, in the interests of the service, or the sport, or the industry, it might be the duty of THE AEROPLANE to criticise the doings of the particular Society, Association or Club with which it was connected.

Similarly, if THE AEROPLANE had any intimate dealings with any particular business firm, for example any particular firm of Insurance Brokers, it might be its duty in the interests of Aeronautics to disagree entirely with the policy of the Insurance world in general. In such a case, if THE AEROPLANE were connected with any Insurance business, whenever it became necessary to write on the subject of Insurance, whatever was written would be subject to the suspicion that it was biased by the paper's financial interest.

Therefore, despite the kindly offers of those who mean well to THE AEROPLANE, it is proposed that the paper shall remain absolutely free and independent, so that it may fulfil its duties, which consist in helping to make the R.A.F. the greatest of the King's Services, helping the sport of flying to become the greatest of British sports and helping the Aircraft Industry to become the greatest of British Industries.—C. G. G.



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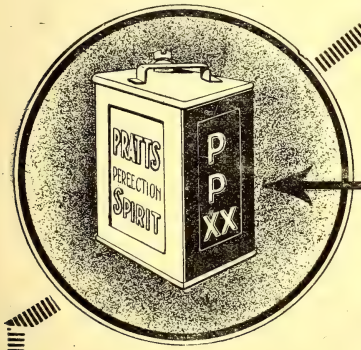
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HANDLEY PAGE'S BOW TO THE PUBLIC.

Not merely because of the name and all that the popular imagination associates with it, but rather because of what it means to the Aircraft Industry, one is deeply interested in the Handley Page, Ltd., prospectus. The public are invited to risk £500,000 offered at par in the shape of Cumulative and Participating Preference shares in return for a fixed minimum dividend of 7 per cent. and the chance of a maximum dividend of 14 per cent. if earned.

Value of the Label.

Considering the reputation in practical aeronautics of Mr. Handley Page, it is to be hoped that this venture into the arena of public finance will add to the success of the Handley Page concern and the wealth of the investors concerned. When one pays a few shillings for a bottle of "White Label" or "Red Seal" one really does not want the label, only a decent liquid. The same with this particular prospectus. The public are paying something for the name and expect good stuff and good profitable results. Without a doubt it will get good stuff and hopes for the profit.

The Capitalisation.

Candidly the capitalisation appears to be more than moderate. The sum of £650,000 is a lot of money: the original capital was £10,000, but one must take into consideration the epoch-making events, the extraordinary developments and complete change of character since the "civilising" influences of the war first manifested themselves. "Comparisons are odious," says the Bard: in this particular case they are distinctly so.

Still, £650,000 is a lot of money. Divided into £500,000 Participating Preference shares and £150,000 Ordinary shares, it means that, after providing for depreciation, etc., etc., etc., £35,000 is required to meet the 7 per cent. Cumulative dividend on the Preference shares. After a corresponding 7 per cent. dividend is paid on the Ordinary shares, involving a further £10,500, two-fifths of any surplus profit will be distributable among the Preference shares up to a maximum of 7 per cent. This would give 14 per cent. in all.

Examination of Participating Rights.

What does this participation really mean? One may dive into the question instructively. Suppose that the total divisible surplus reached £160,000. By divisible surplus is meant the amount that is available after depreciation, internal strengthening, and the dozens of other essential appropriations that must be attended to for the upbuilding of a financially sound company.

Assuming, therefore, that the divisible surplus profit be £160,000, there would remain £114,500 after meeting the fixed 7 per cent. dividend on the total capital.

Two-fifths of this £114,500 would represent the additional 7 per cent. dividend on the Preference shares offered to the public. The remaining three-fifths would be equal to approximately 45 per cent. on the Ordinary shares. This is just a rough calculation for the purpose of illustrating the participating position of the Preference share capital.

Not Very Much Information.

It must be confessed that the information provided for the guidance of the investing public is not by any means abundant or elaborate. The statement of profits should have been amplified so as to enable one to form an opinion of the real position.

One would not desire a mass of statistical matter with rosy-coloured deductions misleading the public with expectations beyond any reasonable chance of realisation: such stuff is unnecessary, but there is a happy medium between a toneless and bald statement and an elaborated array of figures calculated to impress the investor unduly.

Toneless Statistics.

The Handley Page, Ltd., prospectus is too bald and toneless, and perhaps unduly modest, which perhaps suggests that the sponsors are really indifferent whether the public subscribe for the shares or whether they do not. There is a statement of annual profits before the deduction of royalties, and business turnover of each year is provided.

But neither of these sets of figures really convey much, if anything, as a guide for the prospective investor. Can it be that this modesty of detail is intentional and for the purpose of not enlightening competitive undertakings?

Financial Details of Interest.

As to the purely financial aspect of the transaction, Mr. Handley Page receives 140,000 of the 150,000 Ordinary £1 shares for the patents, designs, inventions, etc., and also for any improvements or further inventions relating to aircraft made by him during the seven years ending December 31st, 1925. By this agreement he undertakes to act as managing director for seven years from January 1st, 1919, which agreement he can extend for successive periods of three years during his life.

Of the £500,000 raised by the present issue of Preference shares, £100,000 will be used for paying off loans to the bank, raised for the purpose of coping with the growth of the business, and the balance will provide working capital and also meet the purchase of the factories and plant erected by the Ministry of Munitions. The price thereof is being arbitrated.

WHITEHEAD SHARES FOR SALE.

Why should J. A. Whitehead be so solicitous as to hawk (this is the term of a recipient shareholder) shares of the Whitehead Air Company (1917), Ltd.? It seems unbecoming of a governing and managing director to do such a thing. Under date of October 24th, 1918, the shareholder in question received this letter: "In accordance with my practice of communicating personally with you, informing you at once of matters of interest in connection with the business, I have the pleasure to inform you that the preliminary figures for the year ending September 30th, 1918, as now before me (after making ample allowance for depreciation and the final adjustment of figures) show that the fixed dividends on all classes of shares have been earned some three times over; the fixed dividend will therefore shortly be declared.

"It must of necessity take some little time before the final accounts are complete and audited, when the surplus dividend will be distributed."

The same shareholder received an offer from Mr. J. A. Whitehead this month to sell to the shareholders 7 per cent. Cumulative Participating Preference shares of £1 each in Whitehead Aircraft (1917), Ltd., at par—*i.e.*, £1 per share. "Why is it necessary," asks the shareholder, "to hawk shares in the second year of the company's existence?"

One must repeat: it is strange practice. Further, are the terms offered reasonably attractive? That is debatable with the 10 per cent. Participating £1 Ordinary shares changing hands in the Stock Exchange about 10s. 4½d. to 10s. 10½d. each.

CURRENT TOPICS.

Insuring Easter "Flips."

So much is said in the papers about the expected "boom" in Easter aerial "joy rides" that the question of insurance connected therewith is important. The Aviation Insurance Association has been fully alive to the business, which is what one expects of specialists. They have been quite prepared to quote rates either for omnibus policies to the aviation company, under which the companies would declare each risk when incurred, or for individual policies.

Interesting Quotations.

Provided a normal flight was to be made in an approved type of machine, the company was prepared to quote a rate of about 8d. per £100 to cover the risk of death of a passenger during a "flip." The minimum premium would be 2s. 6d., and for about 3s. 4d. the passenger could take out a policy covering the risk of death for £500.

For another premium of about 2s. 9d. the intending passenger could effect a policy covering certain disablement benefits. These benefits include the payment of £500 in the event of the loss of two limbs or both eyes or one limb and one eye; £250 for the loss of one limb or one eye; £500 for permanent disablement from all active occupation, and £5 per week (after the first week) for temporary total disablement up to 26 weeks, the limit of claim under one or all headings. For about 6s. 1d. per £500 the intending passenger could thus insure against the risks of death and non-fatal accidents together. If trick or night flying were to be indulged in, additional rates would be charged.

Cynical.

From the preliminary statement covering all the State War Insurance schemes it appears that the premiums received for aircraft and bombardment risks accepted reached £13,610,000, while the claims paid and outstanding losses amounted to £2,970,000, leaving a surplus of £10,640,000. One might suggest, cynically, that the very fact that this is one of the very few profitable State transactions is enraging some of the critics.

New Issues Coming Out Freely.

An interesting point is the constant increase in the number of New Issues curtseying for the kind consideration of the investing public. Times are changing rapidly in this respect; it is to be hoped that the public will show discrimination in the selection of the outlets for their savings: it is necessary.

Wellesley-Brown Aircraft Prospectus.

There is published the prospectus of the Wellesley-Brown Aircraft, Ltd., with a capital of £100,000, inviting subscriptions for 91,000 £1 shares at par.

The company was incorporated in September, 1918, and acquired the whole of the rights in an invention of a high-power internal combustion engine for aeroplanes (applicable in a modified form to motor-ships, boats, cars, etc.), "designed to give greater horse-power than obtainable in other designs, and run continuously for protracted periods with a minimum of vibration. . . . Applications have also been made for patents in respect of certain novel features introduced into the design for the engine."

He would be an optimist who risked his money in such a venture without some fuller knowledge of the position. The business has yet to prove its capabilities, which is a serious consideration; the details given are meagre, and the estimates of the value of Royalties not sufficiently convincing.

MORTGAGES, CHARGES, AND SATISFACTIONS.

Flightcraft, Ltd.—Issue on March 19th, 1919, of £500 debentures, part of a series already registered.

Flightcraft, Ltd.—Issue on March 29th, 1919, of £100 debentures, part of a series already registered.

Rolls-Royce Releases.

The following account of an attack by a large British flying boat on a German Zeppelin of the latest type during the latter part of the war has made a belated appearance. The boat was fitted with two powerful Rolls-Royce engines and carried two pilots, a wireless rating, and a petty officer engineer.

One of those on the boat, describing their experiences, said:

"We left our base at 1.15 p.m., and at 4.30 p.m. a German Zeppelin of the latest type was observed on the port beam. It was about 1,500 feet above us, approximately a mile away, and was proceeding due east in the direction of Heligoland. Our machine was at once put to its best climbing angle, the guns were tested and everything found satisfactory—the engineer rating proceeded to the rear gun cockpit and tested both guns.

Zeppelin Attacked with Bombs.

"By this time we were at a height of 6,000 feet. The hostile craft had evidently seen us first, and was endeavouring to get directly over our boat in order to attack us with bombs. When we had reached a height of 8,000 feet (the Zeppelin had climbed to 9,000 feet) the attack was opened.

"We fired about 120 rounds of explosive ammunition, and the engineer rating also fired about the same number of rounds. By this time the Zeppelin was about 500 yards distant—all our fire appeared to hit her. Little spurts of flame caused by our explosive bullets appeared all over the Zeppelin envelope, and she discharged what appeared to be a great amount of water ballast and threw many articles overboard. Then the nose of the great Zeppelin gradually rose and she commenced to climb above us as fast as possible.

A Gun Stoppage.

"Unfortunately we had a gun stoppage which meant a good many minutes' delay, the breech of the gun having to be taken to pieces. All the while the Zeppelin continued to climb, and again endeavoured to get directly over our machine. In this it eventually succeeded and dropped five or six bombs. The engineer then reported that seven hostile destroyers were circling beneath us. We were now at a height of 11,000 feet and the Zeppelin about 12,500 feet.

"We again opened fire, and another 130 rounds of explosive and tracer bullets were put into the Zeppelin. It was noticed that her port propeller almost stopped and she steered hard to port—it was concluded that the port engine had been hit by gun-fire as well as other parts of the craft, as the envelopes and gondolas seemed a background for all the flashes of the explosive and tracer bullets. There were more outpourings of ballast and articles and considerable smoke.

A Tracer Bullet Exploded in Gun.

"It was concluded that the Zeppelin was finished, but she again headed for Holstein in a crab-wise fashion, emitting much smoke. We were again stopped with gun trouble, one being a bad jam—a tracer bullet exploded in the gun and flashed in the face and on the hand of one of the pilots, but outside a few scratches he received no injury.

"As soon as the gun was cleared the machine was ready to attack again—the Zeppelin was then proceeding due east, still in a crab-wise fashion.

"It was losing its height and emitting black smoke, although parts were pure white. Just then the hostile destroyers beneath us opened fire, and, owing to shortness of petrol for the return journey and being only a few miles from Heligoland, we were forced to give up any further attack. The fighting had last for one hour and five minutes.

Alighting on the Sea for Repairs.

"As our boat was difficult to control in the air, we alighted on the sea, and then ascertained that the rudder and elevator were slightly damaged. The German destroyers were steaming with all possible speed in our direction, so repairs were quickly carried out, and we once more rose into the air and left the destroyers behind. We eventually reached home without further adventure, but with practically no petrol.

"During the whole time in the air, which was 7½ hours, the two Rolls-Royce engines ran perfectly, and it was doubtless due to their reliability that we were able to make this lengthy and effective flight and return successfully."

[This is valuable testimony to the joint work of Lieut.-Col. John Porte, C.M.G., and of Mr. F. Henry Royce.—Ed.]

LIEUT.-COL. J. B. BARRINGTON.

Lieut.-Col. J. B. Barrington, who has now returned to civilian life, has accepted the position of Chief Assistant Engineer to Rolls-Royce, Ltd. For six years prior to the outbreak of war he was on the engineering and designing staff of this firm, and from March, 1915, he has done war service, firstly in connection with the aero-engine department of the Admiralty, and, secondly, as officer in charge of aircraft engines, immediately under the head of the technical side of aircraft.

The other principal officers of the department serving under Mr. F. Henry Royce, the Engineer-in-Chief, are Messrs. Day and Elliot, Chiefs of Designing Staff; Messrs. Hailey and Olley, Chief Production Draughtsmen; Messrs. Nadin and Haldenby, Equipment Engineers; and Mr. Hall, Metallurgical Chemist.

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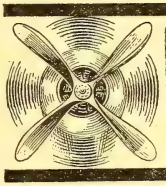
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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

AIRCRAFT IN PARLIAMENT

THE HOUSE OF LORDS.

April 16th.

NAVAL, MILITARY, AND AIR FORCE SERVICE BILL.

The House did not insist on the amendments which it had made in this Bill and with which the Commons had disagreed.

* * *

THE HOUSE OF COMMONS.

The following oral answers were given on April 14th :—

BRITISH CELLULOSE COMPANY.

Lieut.-Col. MALONE asked the Prime Minister whether his attention has been drawn to the fact that permission was granted to the British Cellulose and Chemical Manufacturing Company to issue fresh capital in January last; whether the case of the company was *sub judice* at that date; and whether it would have been preferable to have suspended the issue pending the publication of the Report of Lord Sumner's Committee?

The CHANCELLOR OF THE EXCHEQUER (Mr Chamberlain) : The answer to the first part of the question is in the affirmative. The matter was carefully considered, and it was not considered advisable to suspend the issue.

Mr. BOTTOMLEY : Is it not the fact that the people most pressing for the publication of this Report are the company itself?

Mr. CHAMBERLAIN : I have no knowledge of that, Sir.

AIR SERVICES—MACHINES REDUCED.

Mr. RAPER asked the Under Secretary of State for Air whether a number of aeroplanes which were quite fit for instructional purposes and for practice flying have been destroyed after the engines had been removed, when they could have been put to good use in training cadets and junior flying officers; and whether a number of late types of machines have been destroyed in France after the engines had been removed, when they have merely had their under-carriages crashed, broken one or two spars, or suffered some other easily repairable injury?

The UNDER SECRETARY OF STATE FOR AIR (Major-General Seely) : The machines that have been reduced to produce, i.e., reduced to their component parts, fall into two classes :—

(*a*) Those that have been declared "obsolete" by the Air Council; one of the points taken into account by the Council in pronouncing a type "obsolete" is its suitability for instructional or practice flying. The total number of such machines reduced to produce from November 11th, 1918, to February 28th, 1919, was 2,646.

(*b*) Those that have been so damaged in flying accidents as to be beyond the capacity of the unit concerned to repair them, and not worth the cost of transport to a repair depot. The only standard machines reduced to produce in France are of this class.

HANDLEY PAGE MACHINES—HENDON.

Mr RAPER asked the Under Secretary for Air what damage was sustained by the twenty Handley-Page machines which have been left uncovered in the wet at Hendon for periods varying from one month to three months during the recent bad weather, and the value of all parts, both as regards machines and engines, which have been, or will be, replaced as a result therefrom before all these machines can be passed as serviceable?

Major-Gen. SEELY: The total cost of making good the damage sustained by the thirty-two Handley Page machines which had to be left in the open at Hendon Aircraft Acceptance Park was £1,672 0s. Of the damage sustained part was due to failure of the dope covering certain of the fabric parts, and the remainder due to the very high winds which injured some of the tail skids, control cables, etc.

RESERVE OF AVIATORS

Mr. RAPER asked the Under Secretary of State to the Air Ministry whether it is the intention of the Air Council to continue the training of cadets and officer pupils who have already received part of their instruction so as to form an Air Force Reserve similar to the Special Reserve of the Army, so that a number of aviators can be called up for training for a set period in each year, thus securing to this country an adequate reserve of aviators prepared for any national emergency?

Major-Gen. SEELY : There are already more than sufficient trained pilots to meet all the requirements of the Royal Air Force Reserve, so far as can be anticipated, and it is not considered necessary to call upon cadets whose training is not completed.

CIVILIAN FLYING.

Mr. JOYNSON-HICKS (*by Private Notice*) asked the Under Secretary of State for Air whether he is yet in a position to make any statement as to the progress with the Civilian Aviation Department, and when it will be possible to permit civilian flying in this country?

Major-Gen. SEELY : It is intended to start civilian flying on May 1st Applications have been received from various companies for permission to make civilian passenger flights during the Easter holidays. It has been decided to give this permission as from April 17th to April 22nd, inclusive; flights to be limited to a radius of three miles from an approved aerodrome, and on an undertaking that the rules of the aerodrome shall be strictly observed Owing to the short time available it will only be possible to give approval to service types which have been built under the supervision of the Aircraft Inspection Department.

Applications should be sent to the Secretary, Air Ministry (C.G.C.A.) and must state :—

(*a*) The type of machine with sufficient particulars to identify it.

(*b*) The full name and surname of the pilot.

(*c*) The location of the aerodrome (and of the aircraft), and

(*d*) The name of the company or firm applying.

I am in a position to make any definite statement with regard to the first part of the hon. Gentleman's question, but I hope to be able to do so after Easter

ROYAL AIR FORCE—EQUIPMENT OFFICERS (GRATUITY).

Lieut.-Col. SPENDER CLAY asked the Secretary of State for War how the gratuity is calculated for Equipment Officers who joined as such prior to the issue in 1916 of H.C.I. 193; and whether these officers are entitled under their contract to the gratuity as laid down in Article 226 of the Pay Warrant?

Major-Gen. SEELY : Army Council Instruction 193, of 1916, was issued with a view to making clear which officers of the Special Reserve of the Royal Flying Corps were entitled to gratuity under Article 226 of the Army Pay Warrant. At the time this Article was framed the appointment of "equipment officer" did not exist, and the special gratuity of £150 per annum provided under it was designed only for flying officers and not for those engaged on ground duties. Officers appointed as equipment officers accordingly have no contract entitling them to gratuity under Article 226 B, but they are eligible, under Article 497(*b*) of the Pay Warrant, for gratuities of 124 days' pay for the first year and 62 days' pay for each further year, or part of a year, of service, based, subject to certain conditions, on the highest rate of pay they have drawn at any time during their service

AIR ROUTES.

Lieut.-Col. MOORE-BRABAZON asked the Under Secretary of State for the Air Ministry whether it is still the policy of the Government to allow private enterprise at first to operate the easier of the great air routes, the more difficult being operated by the State; and whether such decision has been changed in view of the statements to the effect that the Cairo to India and beyond route is to be operated by the Government?

Major-Gen. SEELY : The policy of His Majesty's Government is broadly that stated in the first part of the question. Strategic considerations enter largely into the route between Cairo and India, and it would, therefore, be premature to make any precise statement at present.

* * *

April 14th.

The Lords Amendments on the Naval, Military and Air Forces Service Bill were considered. It was resolved—

"That a Committee be appointed to draw up reasons to be assigned to the Lords for disagreeing to their Amendments to the Naval, Military, and Air Forces Service Bill.

"That the Committee do consist of Mr. Churchill, General Seely, Captain Wedgwood Benn, Mr Tyson Wilson, and Colonel Royds.

"That three be the quorum, and that the Committee withdraw immediately."—[Mr. Churchill.]

April 16th.

The Royal Assent was given to the Naval, Military, and Air Force Service Act, 1919.

* * *

The following written answers were given on April 15th :—

AEROPLANE MANUFACTURE—(GERMANY AND AUSTRIA).

Mr. RAWLINSON asked the Prime Minister what steps, if any, have been taken to prevent the manufacture of aeroplanes in Germany and Austria at the present time?

Mr. CHURCHILL : No steps have been taken in either case to prevent such manufacture under the terms of the Armistice, but export is prohibited.

* * *

The following written answer was given on April 16th :—

ENEMY AIR RAIDS—(COMPENSATION).

Mr. SAMUEL SAMUEL asked the Prime Minister whether he will take steps to compensate British subjects, who were uninsured, and whose property has been destroyed by damage by air raids and bombardment, out of the first moneys received from the German war indemnity, in the same way as French and Belgian citizens are compensated for the material damage to their property in consequence of the German invasion?

Mr. BONAR LAW : I cannot make any statement at present with regard to the disposal of moneys received from the German indemnity.

* * *

The following oral answers were given on April 16th :—

MISS VIOLET DOUGLAS-PENNANT.

Mr. THOMAS RICHARDS asked the Prime Minister whether, in view of the fact that the conditions of the pledge given to the House by the Secretary of State for War in the case of Miss Violet Douglas-Pennant have now been complied with, the inquiry promised is to take place?

Mr. CHURCHILL : I have been asked to answer this question. I am ready to lay on the Table of the House the correspondence which has passed up to the present on this subject between the Air Ministry and Miss Douglas-Pennant if that is the desire of those who are acting for her, and if the House considers it of sufficient importance.

So far as it has at present proceeded, it does not, in my opinion, disclose any case different from that which could be made by any person superseded in any situation against those among whom and under whom she has been working. I have, however, asked for more precise definitions of the various allegations which Miss Douglas-Pennant has preferred.

It is possible that some of the statements might be suitable for private persons to test in the Courts in the ordinary way; but I do not at present discern any sufficient grounds to justify the considerable expense of an official inquiry.

Mr. RICHARDS : Is it not a fact that Miss Pennant made specific charges against certain people?

Mr. CHURCHILL : I have said I am willing if those who are acting for Miss Pennant wish it, and if they think it is in her interest, to lay the correspondence on the Table of the House so that hon Members can judge for themselves.

Brig.-Gen. Sir J. THOMAS : Will the right hon. Gentleman supply the House with the report of the hon. Member for Luton (Mr. Harmsworth) in respect of which the Prime Minister has already promised an inquiry into this case?

Mr. CHURCHILL : No, Sir, I am not prepared to lay that report on the Table. After making inquiries I ascertained that the hon. Member for Luton considered it was a private report drawn up by him for the information of the Prime Minister, and, on general grounds, it would be fatal to the administration of public Departments if documents of this kind prepared in this way were subsequently to be published.

Sir O. THOMAS : Will the right hon. Gentleman say why the advice of the Prime Minister was not acted upon?

Mr. DEPUTY-SPEAKER : That does not arise out of the question.

Mr. TYSON WILSON : If the right hon. Gentleman lays on the Table of the House the papers referred to, will he also lay on the Table the letters of protest from Miss Pennant's subordinates?

Mr. CHURCHILL : I think the matter is one between this lady and the Department concerned. The correspondence I have mentioned appears to be relevant to the issue.

Mr. BILLING : Are we to understand that in the event of this case being taken to the Courts all the official documents will be disclosed?

Mr. CHURCHILL : It is not for me to attempt to lay down rules for the conduct of proceedings in the Courts.

AERONAUTICS and The LAW

AIR ADVERTISING.

By "THE LINCOLN IMP."

M. Jourdain's surprise on learning that he had been speaking "prose" all his life was nothing to that which an advertising expert would exhibit on hearing himself described as "a subtle psychologist." But the fact is incontestable. To be successful, an "ad." must compel attention to itself *nolens volens* the public; this cannot be achieved, at least on a large scale, without a subtle intuition into the psychology of the crowd.

This is not going to be a dissertation on the general art of advertisement, but it is relevant to remark that to achieve big results an advertisement has two conditions to fulfil—(a) the advertisement must be visible to masses of men and (b) it must force their attention to itself. By no vehicle of advertisement are these two conditions better fulfilled than by aircraft aloft in the sky. Crowds cannot help looking up when aircraft pass overhead. It may therefore be predicted with some confidence that aircraft will be extensively utilised for advertising projects, unless legal difficulties intervene.

It is to the advantage of the aircraft industry as a whole that reasonable aerial advertisement should be allowed. The revenue from this source should be a far from negligible item to set off against the running costs which advertisement need not increase. Are there, then, any legal restrictions on this form of advertisement as the law stands at present?

First Act to Regulate Advertisements.

The first Act ever passed to regulate advertisements in general was the Advertisement Regulation Act, 1907. This Act authorises local authorities to make bye-laws respecting the exhibition of advertisements, and for breach of such bye-laws imposes a penalty of £5 in the first instance, with 20s. a day extra, after conviction, so long as the breach is persisted in.

The scope of the Act is, however, very limited, since it extends only to (a) hoardings and similar structures and (b) advertisements exhibited in such places or in such manner or by such means as to affect injuriously the amenities of a public park or promenade or to disfigure the natural beauty of a landscape.

Is an Airship a Structure?

It seems very improbable that even an airship could properly be described as "a structure similar to a hoarding"; but if "landscape" can be said to include "skyscape," it does seem arguable that a huge aerial advertisement might disfigure the natural beauty of a sky scene or a sunset. Particularly so in the case of an anchored aircraft, such as a kite balloon.

A kite balloon is clearly capable of falling within the statutory definition of "a sky sign" which includes "any balloon, parachute, or other similar device employed wholly or in part for the purposes of any advertisement or announcement on or over or above any house, building, structure, or erection of any kind, or on or over any street or public way."

Inclusion of the Word "Parachute."

It would have seemed tolerably clear from the context that only fixed or anchored signs were hit at by this definition, but for the curious inclusion of the term "parachute." With the definition as it stands, it could be said that an airship is a similar device to a balloon, and an aeroplane a device similar to either a balloon or a parachute. The result of this interpretation, if correct, is practically to prohibit advertisement in the air above the British Isles. For new sky signs are prohibited over London by the London Building Act, 1894, and over such part of the rest of the British Isles as a principal Secretary of State decides by the Public Health Acts Amendment Act, 1907.

Those interested in aviation will do well to bear these Acts in mind when legislative provision is being made for commercial air navigation in general.

Another method of advertisement from aircraft is by the dropping of leaflets; this appears to have become so prevalent in the R.A.F. a short while ago that it was thought necessary to prohibit it by Air Ministry Weekly Order.

Leaflets Scattered by Aircraft.

"The Imp" has seen people picking up leaflets in Oxford Street advertising some charity or War Bonds and dropped from an aircraft overhead. If it could be said that the notices so dropped were (a) distributed in Oxford Street and (b) by any person riding on a vehicle, then the aviator was committing an offence for which the penalty was 10s., unless he had the authority of the Commissioner of Police or was selling newspapers (Metropolitan Streets Act, 1867, s. 3). It may be that each leaflet dropped is a separate offence.

So far as "The Imp" is aware, there is no special legislation directed at another form of aerial advertising usually included in the expression "exhibition flying." It would seem very desirable in the interests alike of the public at large, the pilots of the machines, and bona-fide acrobatics that the law should require special safeguards to be provided where extra risks are incurred for the mere sake of advertisement. The Lincoln Imp.

Carriage by Air.

An Important Point for Aerial Carriers.

In reply to Mr. Bickmore "The Lincoln Imp" writes:—

A carrier of goods may be "a common carrier," or he may not. A carrier who undertakes to carry for anyone who asks him is a common carrier. If he limits his customers to particular persons he is not.

A common carrier is subject to peculiar liabilities, originating in the custom of the realm and incorporated in the common law of England. A common carrier may carry either by land or by water. Can he carry by air?

In his sound and useful letter in a recent number of The Aeroplane Mr. Bickmore assumes that it is possible for a man to be a common carrier by air, and probably this is so. The common law of England is as wide as the realm and as expansive as our language.

Apply the analogy of railways. The owners of "The Rocket," when steam traction was novel, were common carriers at law equally with Mr. Cripps the Carrier or Barkis the willing. They were none of them limited in their responsibility to the exercise of reasonable care, but had the liability of insurers in respect of the goods they carried.

The common law liability of carriers has been modified in some degree by statute; in particular by the Carriers Act, 1830. Railways, in 1830, had only just come into existence and were not mentioned by name in the Act, which extended, however, to all public conveyances by land.

The preamble refers to the frequent practice of bankers and others of sending by the public mails and conveyances packages containing money, bills, notes, jewellery, and other articles of great value in small compass, with the result that common carriers have been exposed to great and unavoidable risk, and have sustained heavy losses. The Act then proceeds to relieve the carrier of his common law liability in respect of various articles which it specifies if above the value of £10 unless a declaration of nature and value is made and an increased charge is paid.

Articles "of great value in small compass" are the very type of goods which will be carried by air, but the carrier by air will not have the protection of the statute as would a carrier by land since the application of the Act is confined to the latter by its express terms. It is up to those who intend to fly for hire as carriers by air to see that they are protected by special legislation, or they too may sustain heavy losses.

Meanwhile a curious question may arise if valuables are destroyed or damaged by a crash on the 'drome for which the common carrier is in no way to blame. Is he within the protection of the Act as being "a carrier by land"? If the sea analogy be applicable he is, since it has been held that a contract to carry goods partly by land and partly by sea is divisible, and the Act has been applied to the land part of the journey.

THE WAR MEMORIALS EXHIBITION.

The Royal Academy War Memorials Committee has been considering for some time past the best means of giving guidance to promoters of war memorials and of meeting the interest of the general public in the selection of suitable designs and of artists specially qualified for their execution, and the Committee has now decided to hold an Exhibition of Memorials, which will be arranged in two distinct sections during the present year.

It is proposed to hold the first section at the Victoria and Albert Museum, South Kensington, in June. This section will comprise selected examples of memorials executed in past and recent times by deceased and living artists.

The second section, to consist of new designs for war memorials in any class of art or craft with a view to the circumstances of the present war, will be held at the Royal Academy in October.

THE TRANS-ATLANTIC COMPETITION.

On Friday, April 18th, Major Wood, R.A.F., pilot, and Capt. Wyllie, R.A.F., navigator, left Eastchurch for Ireland in the Short trans-Atlantic machine. An experimental machine piloted by Mr. Lankester Parker, the Short test pilot, was acting as escort.

All went well until a short time after Holyhead had been passed, and then the trans-Atlantic machine fell into the Irish Sea. The cause of the descent was, it is alleged, an air lock in what one of the daily papers called the "petrol cistern"—*id est* system.

Both the pilot and the navigator were rescued and the machine has been salved in a more or less damaged condition. Major Wood intends making another attempt should the prize not have been won by the time he is ready to make a start

Other Competitors.

Several competitors are now ready to attempt a trans-Atlantic flight for the £10,000 prize. The weather conditions, however, have not been sufficiently suitable for an attempt to be made from either side of the Atlantic.

The Sopwith Plans.

The Sopwith aerodrome at St. John's, Newfoundland, is at present soaked with rain and snow. Mr. Hawker, the pilot, made a trial flight recently, during which the sending instruments of the wireless apparatus were damaged. This is unfortunate, as it decreases the aviator's chances of being picked up should a forced landing be made.

Mr. Hawker proposes to fly fairly low until he has crossed the Grand Banks, now probably fog-bound. Beyond that point he expects finer weather, and he will then ascend to a height of about 8,000 ft., which will be the average height over the greater portion of the route. At this height he hopes to avoid conditions of fog and mist which are normally very frequent over the Atlantic area at this season, and the moon will assist him in navigation.

In the early morning, if the position is uncertain, he will descend sufficiently low to come within sight of any ship which may be passing, and the position of which he can determine beforehand by his wireless, and will obtain his latitude and longitude from it. With this check on his reckoning he will ascend again and continue his flight at a higher altitude until he reaches the British coast. In the event of any accident which compels him to return he would plan to make a new flight immediately after repairs could be made, unless in the meantime some more fortunate competitor has gained the prize.

The Martinsyde.

Mr. Raynham, who is going to pilot the Martinsyde machine, has declared that the aeroplane could fly for twenty-five hours at a rate of 100 miles an hour, and it is expected that the pilot will make straight for the west coast of Ireland, and proceed thence to Brooklands, completing the journey in twenty hours.

He added that the failure to provide personal safeguards was due to the fact that he proposed "to cross the Atlantic, not fall into it." Major Morgan, Mr. Raynham's navigator, will lay the course, using the sextant on the stars by night and the sun by day.

The Handley Page Preparations.

The Handley Page aeroplane which is to attempt the flight is now on its way to Liverpool, dismantled and packed in crates, whence it will be sent to Newfoundland. It is expected that the party, which includes Major H. G. Brackley, D.S.O., D.S.C., R.A.F., and Vice-Admiral Mark Kerr, C.B., M.V.O., R.N., the pilots, Major Gran, R.A.F., who will act as navigator, and a wireless operator, will sail on or about May 3rd, for St. John's, Newfoundland.

Discussing the projected flight recently, Major Brackley said that the preparation for an aerodrome at St. John's had been in progress for some time. Owing to the enormous weight of the machine, which, when fully loaded, will amount to about 32,000 lbs., it will require an exceptionally long take-off. With all four engines at full power, a speed of sixty-five miles an hour will have to be attained before any attempt can be made to rise, and a run of at least half a mile will be necessary, but if possible a clear mile will be prepared.

The wireless operator and the navigator will be covered in and protected from the weather, but the pilot and the observer will be exposed, save for a thick glass screen. Each of them, however, will be wearing clothing which can be warmed instantly by electricity, if warmth is needed. No boat is being carried, but life-saving apparatus will be included in the equipment, and a special balloon can be sent up to attract the attention of passing ships should the machine fall into the sea.

For calculation of the drift, a special instrument is being carried, and smoke-bombs will be released to show which way the wind is blowing. Bearings will be picked up from ships en route. Thermos flasks of cocoa will be provided. If possible, a landing will be made near London, at Hendon or Cricklewood, but, in case of necessity—for instance, if petrol is running short—the machine will come down in Ireland.

The American Preparations.

The first official announcement regarding the proposed trans-Atlantic flight by United States Navy seaplanes was issued by Lieutenant-Commander Harold W. Schofield, who is in charge of publicity regarding the Navy's plans. He stated that the flight would start from Rockaway Beach, where the Naval aviation field is situated, and would follow the coast-line to Newfoundland, to a base selected for the take-off.

Newspapers will have 24 hours' advance notice of the start. Probably there will be three flying-boats of the N.C. type. It has not been decided whether there will be five or six men in each crew. The harbour in Newfoundland whence the start will be made has not been selected. The seaplane will not be entered for the competition.

The Ninth Entry.

Another entry has been lodged with the Royal Aero Club, this making the ninth. Mr. J. A. Peters, representing the Alliance Aeroplane Co., Ltd., of Hammersmith, one of the several aircraft concerns controlled by Mr. Sam Waring, is the designer of the machine, which is fitted with a 450 h.p. Napier "Lion" engine. Mr. Peters has been nominated as pilot and Capt. W. R. Curtis, R.A.F., as navigator.

The Only Airship Attempt.

Much interest has been aroused by the announcement that the large rigid airship R.33, which a few weeks ago passed its first trial test, has now undergone several additions and improvements, and next week will be completely ready for a trans-Atlantic flight. Many more petrol tanks have been added, bringing the number up to 87, and this will permit of an 88 hours' continuous flight.



The Short Biplane (360 h.p. Rolls-Royce Engine) in which Major Wood, R.A.F., and Captain Wyllie, R.A.F., came down in the Sea off Holyhead.

THE WORK OF THE ROYAL AERONAUTICAL SOCIETY IN 1918-19.

(Communicated by the Secretary, Mr. W. Barnard Farraday.)

Meetings.

A very full and interesting course of lectures was arranged for the current session. During the war, in the national interests, the censorship has rendered it impossible to publish much of the more recent scientific work. But now the necessity for secrecy has to a great extent ceased, and it is hoped that in future years the latest research will be promptly made public at the Society's meetings.

In spite of the precautions observed, however, the lectures offered to the members were undoubtedly of the greatest value and interest, and the Council desire to acknowledge the kindness of Major-General Sir W. S. Brancker, K.M.G., Major L. N. G. Filon, F.R.S., Sir Robert Hadfield, F.R.S., Lieut.-Colonel M. O'Gorman, C.B., Surgeon-General Sir Alfred Keogh, G.C.B., L. Bairstow, F.R.S., Lieut.-Colonel T. R. Cave-Browne-Cave, Brigadier-General R. K. Bagnall Wild, C.M.G., R.E., Lieut.-Colonel A. Ogilvie, R.A.F., Dr. T. E. Stanton, F.R.S., Brigadier-General E. M. Maitland, D.S.O., Lieut.-Colonel Jenkin, R.A.F., for their support in presiding at the meetings. The Council also offer their most cordial thanks to Major Cochrane Patrick, D.S.O., M.C., R.A.F., Major A. R. Low, R.A.F., Major Philpot, R.E., Captain W. S. Farren, M.B.E., Dr. L. E. Stamm, R.A.F., Captain R. J. Goodman Crouch, Mr. F. W. Aston, D.Sc., Captain F. S. Barnwell, C.B.E., Mr. H. Levy, Lieut.-Colonel T. R. Cave-Browne-Cave, Captain A. P. Thurston, D.Sc., Prof. F. C. Lea, Major H. E. Wimperis and Lieut.-Colonel H. G. Lyons, F.R.S., for the series of admirable lectures placed before the Society.

The Wilbur Wright Lecture.

This lecture for 1918 was held in the Central Hall, Westminster, on June 25th. An audience of over 3,000 assembled to hear Dr. W. F. Durand, Chairman of the American Advisory Committee on Aeronautics, lecture on "Some Outstanding Problems in Aeronautics." Sir William Weir, Secretary of State to the Air Ministry, presided. The Council express their cordial thanks to both these gentlemen.

Juvenile Lecture.

The success of the juvenile lecture last year encouraged a repetition and accordingly, on January 8th, a second lecture for the children of members and friends was arranged. A very large audience of young people assembled. The thanks of the Society are due to Mr. Handley Page for his highly interesting lecture and to Lieut.-Colonel Alan Burgoyne, M.P., who presided.

The Exhibit of Enemy Aircraft.

At the request of the Air Council the Society undertook the distribution of the interesting and valuable collection of the war relics at the Agricultural Hall, Islington. The objects selected by the Society were given to it in trust by the Government and have been distributed by it on permanent loan to the following councils and institutions:—The Universities of Bristol, Leeds, Belfast, Liverpool, Birmingham, Sheffield and Wales; the College of Technology, Manchester; the Technical College, Cardiff; the East London College; the Armstrong College, Newcastle; the Technical College, Swansea; University College, Southampton; the Heriot Watt College, Edinburgh; the Technical College, Glasgow; University College, London; Technical School, Lincoln; Northampton Polytechnic, London; Harris Institute, Preston; South-Western Polytechnic; Technical School, Stockport; Tottenham Polytechnic. Technical School, West Ham; and the Corporations of Gravesend, Ramsgate, Southend, Leeds and Swansea; the Technical School, Blackburn; the Borough Polytechnic Institute, Southwark; the Corporation of Ipswich; University College, Exeter; the Technical Institute, Coventry; the Royal Technical Institute, Salford; Tonbridge School, and the Imperial College of Science.

Demobilisation of Officers and Others in the Flying Services.

The Council, upon the declaration of the Armistice, appointed a Special Committee to consider the problems likely to arise in relation to the employment of members of the Society demobilised from the Services, and the cognate problems existing in relation to aeronautical education. It has throughout advised the Ministry of Labour in relation to these questions. It is proposed to circulate, where it is likely to be of service, a list of members of the Society who have asked for assistance in obtaining employment, and it is hoped that all members will do their utmost to assist fellow members in these critical times.

Qualifications for Membership.

The qualifications which should be required of candidates for technical membership of the Society has again been under consideration on various occasions during the year. In connection with this question of the desirability of instituting examinations, and the acceptance in lieu thereof of the degrees and diplomas of certain universities and colleges came under review. The Council do not think that the time has yet come to institute examinations by the Society, but inquiries are being made with a view to preparing a list of universities, colleges and schools where classes for aeronautical training have been established and where degrees or diplomas in this subject are granted, and of ascertaining which aircraft and other works would be likely to offer an adequate technical training.

The "Journal."

In January, 1918, in consequence of a general demand, the experiment was made of issuing the "Journal" as a monthly instead of a quarterly as heretofore. At the same time, in consequence of the greatly increased cost of printing and paper, the price was increased from 1s. 6d. to 2s. 6d. A publication of this sort is such a heavy expense to a learned society that the experiment was embarked upon with some anxiety, but the result has fully justified the action taken.

The Library.

Recent issues of new books on aeronautics have been added as published, while the collection of bound issues of trade and scientific journals dealing with aeronautics throughout the world has been kept up to date and is nearly complete. Upon the declaration of peace an endeavour will be made to obtain various German publications, which it has been impossible to obtain during the continuance of the war.

Abstracts.

Under the arrangement with the War Office a monthly issue has been made of abstracts from the world's Press on aeronautics. It may be opportune to detail to the members how the abstracts on aeronautics have been prepared. The War Office collected the material, the Society and the National Physical Laboratory jointly appointed the abstractors. The matter thus procured was issued by the War Office under the editorship of Lieut.-Colonel Wake. The Council desire to place on record their sense of the very useful services of Colonel Wake in the matter.

The Secretary.

The Council desire to express their keen appreciation of the work of the Secretary during the past year; the large increase in membership and highly satisfactory condition of the finances is due in no small measure to his exertions in the interests of the Society. His business qualifications have been specially useful as regards the publications of the Society, which have been a matter of considerable anxiety and difficulty during the war.

The Council also desire to acknowledge with appreciation the valuable assistance given to the Society by Miss St. Barbe, the Assistant Secretary.

Finance.

The financial position of the Society, as shown in the accompanying balance sheet, is satisfactory and continues to improve. In January of the present year a further investment of £500 was made in War Loan, bringing the investments of the Society in this stock up to £1,350. The labour of transacting the office business of the Society would be made considerably lighter and much exceense would be saved if members would, wherever possible, pay their subscriptions by means of a banker's order.

The Honorary Officials.

The Council desire to express their most cordial thanks to Messieurs James Ward and Co. for their services in auditing the books of the Society, and to Mr. B. Woodward, the Honorary Solicitor, who has advised them throughout the year.

DISPOSAL OF GOVERNMENT STORES.

Mr. W. J. Larke, O.B.E., Controller of the Disposal of Miscellaneous Stores has removed from the Hotel Metropole to Caxton House, Westminster, now the headquarters of the Miscellaneous Stores Department, and to which address all communications should be sent.

The Standing Advisory Committee of the Ministry of Munitions on the Utilisation of Surplus War Material has removed from the Hotel Metropole to Caxton House, and all communications should be sent to the Secretary at that address.

THE AERO CLUB OF ITALY.

The Aero Club of Italy announces that it has appointed "L'Aeronauta" as its official organ. This review is a highly technical monthly, and is published by Prof. Giacomelli at 52, via Colonna, Rome. The yearly subscription is 25 lire, and the editor would be glad to get into touch with English business firms.—T. S. H.

NAVAL & MILITARY AERONAUTICS

FROM THE "LONDON GAZETTE."

Air Ministry, April 15th.

R.A.F.—The following temp. appts are made at the Air Ministry :—Staff Officers, 2nd Cl.—(P). Maj. R. C. Lane, Oct. 28th, 1918.

Staff Officers, 3rd Cl.—Capt. F. F. Loyd, March 8th; (P.) Lt. (actg. Capt.) J. H. Evans, and to retain the actg. rank of Capt. whilst so empld., April 3rd.

Flying Branch.—Lt.-Col. (actg. Col.) C. D. Breese, A.F.C., to be Lt.-Col. (A.), and relinquishes the actg. rank of Col., from (S.O.), April 7th.

Maj. (actg. Lt.-Col.) J. E. Dixon-Spain to be Maj. (A.), and to be actg. Lt.-Col., without pay and allces. of that rank, whilst empld. as Lt.-Col., from (T.), March 26th.

Majs. to be Majs.—(A) J. A. G. de Courcy, M.C., from (S.O.), Feb. 6th; S. E. Parker, M.B.E., A.F.C., from (S.O.), March 27th; (Actg. Lt.-Col.) A. W. Tedder, and relinquishes the actg. rank of Lt.-Col. on reduction of establishment, April 2nd.

Capt. E. A. Taylor to be actg. Maj. whilst empld. as Maj. (A.), Oct. 2nd, 1918.

D. Wood (Lt., Gen. List) is granted a temp commn. as Sec. Lt. (A.), Aug. 19th, 1918, and to be hon. Lt. (substituted for notification in "Gazette," Sept. 17th, 1918).

G. W. Mitchell (Sec. Lt., E. York R., T.F.) is granted a temp. commn. as Sec. Lt., Observer Officer, Aug. 16th, 1918 (substituted for notification in "Gazette," Sept. 10th, 1918, page 10,965).

100086 F./Cadet L. G. Lowe is granted a temp. commn. as Sec. Lt (A.), Aug. 23rd, 1918.

The following relinquish their commns. on ceasing to be empld. :—Lt. H. S. Taylor (Capt., C. Ont. R.), Dec 7th, 1918 (substituted for notification in "Gazette," Jan. 24th, concerning Lt. H. S. Taylor (Capt., Nova Scotia R.)); Lt. R. E. M. Staunton (Lt., Manitaba R.), March 12th.

The following are transferred to unempld. list :—Capt. R. W. Nichol, Jan. 24th; Lt. S. Crosfield, Jan. 28th; Sec. Lt. W. W. McDavid, Feb. 1st; Lt. A. R. Blackeley, Feb. 3rd; Sec. Lt. C. Waine, Lt. R. Brown, Feb. 14th; Capt. (actg. Maj.) A. J. Evans, M.C., Feb. 17th; Lt. (Hon. Capt.) J. E. Chick, Lt. P. Wood, Feb. 19th; Sec. Lt. I. M. B. McCulloch, Feb. 20th; Lt. K. Wallace, Feb. 22nd; Lt. M. E. Burnham, Sec. Lt. E. Dawson, Lt. (actg. Capt.) G. Macfarlane, Lt. B Ord (Lt., Devon. R.), March 4th; Sec. Lt. (Hon. Lt.) R. S. Blacke (Dorset R.), March 5th; Sec. Lt. W. H. Bentley, March 6th; Sec. Lt. K Bannister, Lt. N. C. Bennison (Lond. R.), Sec. Lt. D. V. McLeod (substitution for notification in the "Gazette," March 21st); Sec. Lt. R. G. Wilson, March 7th; Sec. Lt. G. Burton, March 8th; Sec. Lt. H. M. Bickle, March 11th; Lt. S. G. Beard, Lt. B. J. E. Belcher, D.F.C., Lt J. D. Cowie (Arg. and Suth'd Highrs., T.F.), March 12th; Lt. H. A. Francis, March 14th; Sec. Lt. A. M. Wilson, March 15th; Lt. J. Boyd (Scot. Rif., T.F.), Sec. Lt. A. S. Hartley, March 16th; Lt. (actg. Capt.) C. T. Dodd, D.F.C., March 18th; Lt. N. L. Monger, Sec. Lt. W. Turner, March 19th; Sec. Lt. W. Massey, March 20th; Sec. Lt. W. Hagan, Sec. Lt. (Hon. Lt.) R. E. Mathias, Capt. C. H. Stocks, A.F.C., March 21st; Sec. Lt. S. T. Metcalfe, March 22nd; Sec. Lt. K. G. Macmillan, March 25th; Lt. A. A. Baker, Sec. Lt. C. R. Knott, March 27th; Capt. A. C. Benge, Sec. Lt. J. Campbell, Lt. G. H. L. Easterbrook, Sec. Lt. W. R. A. Whettell, March 28th; Sec. Lt. G. L. Cox, Lt. H. A. Bendall, Sec. Lt. O. E. Miller, March 29th; Lt. W. T. J. Atkins, Lt. L. H. Burrows, Sec. Lt. J. O. F. Carrall, Lt. W. R. Plaskitt, March 30th; Sec. Lt. W. G. Addison, Maj. H. G. Brackley, D.S.O., D.S.C., Sec. Lt. J. C. Buckley, Lt. I. A. Johnson-Gilbert, March 31st; Capt. R. S. Arnold, Sec. Lt. W. Badger, Lt. H. A. G. Baker, Sec. Lt. I. R. H. Hall, Lt. A. R. Morrison, Lt. E. T. Martin, Lt. (actg. Capt.) J. MacDonald, Lt. T. W. Williams, April 1st; Sec. Lt. J. R. Barrett, Lt I. S Black, Sec. Lt. A. I. Boyer, Sec. Lt. F. Chalcroft, Sec. Lt. A. J. Cripps, Sec. Lt. J. B. Gunn, Sec. Lt. J. K. Jamieson, Sec. Lt. W. A. Mutton, Sec. Lt. S. MacNeice, Capt. J. R. Ross, Lt. J. C. Tate, Sec. Lt. G. E. Whitaker, Lt. A. C. Watkins, Lt. H. R. G. Whates, April 2nd; Lt. (Hon. Capt.) H. Baring, Lt. L. C. Bower, Sec. Lt. A. McL. Blain, Lt. P. A. Carrie, Sec. Lt. F. D. Chappell, Lt. T. H. Whitby, April 3rd; Sec. Lt. P. G. Clarabut, Lt. A. C. Cooper, April 4th; Sec. Lt. P. F. Bruce, April 5th; Sec. Lt. C. Buckton, Lt. M. J. Barnard-Smith, April 6th; Lt. D. F. Mackay, April 7th; Lt. S. J. Allen, Lt. H. C Alexander, Lt. (actg. Capt.) F. F. Babbage, Sec. Lt. R. H. G. Boys, Sec. Lt. R. R. H. Bruce, Lt. G. L. Du Cros, Lt. A. J. Coleman, Sec. Lt. A. B. Crawford, Lt. H. R. Cleveland, Lt. L. G. Clark, April 9th; Lt. E. Banks, Lt. E. Bradley, Sec. Lt. M. J. Beesley, Lt. C. L. Clutterbuck, Sec. Lt. H. D. Clacher, Sec. Lt. (Hon. Lt.) B. H. Curry, Sec. Lt. M. Cleland, Lt. (Hon. Capt.) H. Claye, Sec. Lt. C. Curtis, Sec. Lt. H. G. Cowley, Sec. Lt. C. W. Christie, Sec. Lt. A. Dickinson, Lt. A. H. Gearing, Lt. S. Moss, April 10th; Lt. O. H. Adams, Lt. H. W. Collander-Brown, Lt. F. C. Boulton, Lt. M. Bevan, Sec. Lt. (Hon. Lt.) S. N. Bourne, Sec. Lt. J. Butler, Lt T. C. Clifford, Capt. H. L. Chadwick, Lt. (actg. Capt.) R. Cook, Sec. Lt. H. Chapman, Lt. J. Burness, Lt. E. H. Channon, Lt. E. G. Johnstone, D.F.C., Lt. J. D. S. McCubbin (North'd Fus.), April 11th; Lt. C. R. Ball, Lt. R. A. Cartledge, Sec. Lt. H. J. Fryer, Sec. Lt. G. W. Elias, Sec. Lt. E. L. Fuller, Lt. W. McClaughlin, April 12th; Lt. F. W. Ambrose, Lt. J. L. Armstrong, Lt. L. G. Arcand, Sec. Lt. W. C. Angus, Sec. Lt. D. Agassie, Lt. W. O. Adams, Sec. Lt. W. Atkinson, Sec. Lt. H. A. Barrett, Sec. Lt. R. McG. Balfour, Sec. Lt. J. Brown, Sec. Lt. G. A. Boyer, Lt. C. A. Bisonette, Sec. Lt. S. Burbidge, Sec. Lt. E. Barker, Sec. Lt. R. B. Butler, Sec. Lt. A. H Butler, Sec. Lt. J. R. Benton, Sec. Lt. R. D. Gilpin-Brown, Sec. Lt. F. H. Brady, Lt. J. W. Bell, Sec. Lt. R. L. Barnes, Sec. Lt. J. A. Carr, Lt. M. S Cook, Lt. W. W. Chreiman, Sec. Lt. C. B. Clark, Sec. Lt. C. R. Curry, Sec. Lt. E. W. Cockerline, Lt. H. H. Costain, Sec Lt H. W. Clark, Sec. Lt C. J. Church, Sec. Lt. J. R. Crocker, Sec. Lt. R. W. Cunningham, Sec. Lt. H. F. Donovan, Sec. Lt. L. C. Ennis, Sec. Lt. A. H. Dubois, Sec. Lt. F. H. Edson, Sec. Lt. B. J. Forester, Lt. F. E. Des Brisay, Sec. Lt. A. B. Gardiner, Sec. Lt. M. A. Genest, Lt. L. M. Goodfellow, Sec. Lt. R. Gilbruth, Sec. Lt. J. A. Guymer, Lt. D. R. Grant, Lt. O. St. C. Harris, Sec. Lt. J. H. Hodgins, Sec. Lt. A. E. Hounson, Sec. Lt. A. McDonald, Lt. H. L. MacDonald, Sec. Lt. H. A. McGrath, April 13th; Sec. Lt. (Hon. Lt.) S. K. Bunce, Lt. B Burr, Sec. Lt. T. M. Bartlett, Lt. C. W. Band, Lt. J. E. Carpenter, Lt. C. C. L. Coulson, D.F.C., Lt. K. R. Cole, Sec. Lt. J. Cockburn, Sec. Lt. S. E. Crookell, Sec. Lt. G. A. Franklin, Sec. Lt. L. W. Long, April 14th; Sec. Lt. L. H. T. Ashburner, Sec. Lt. H. Atkinson, Sec. Lt. W. H. Barry, Sec. Lt. C. G. Beatty, Lt. L. A. Budd, Sec. Lt. H. N. Baker, Sec. Lt. K. C. R. Coulter, Sec. Lt. J. R. E. Coburn, Sec. Lt. G. H. Carley, Sec. Lt. R. Connor, Lt. (actg. Capt.) J. M. Drysdale, Lt. T. R. Dawson, Lt. H. A. F. Goodison, Sec. Lt. C. B Gibson, Sec. Lt. F. Guthro, Sec. Lt. M. Golt, Lt. D. S. May, Sec Lt. S. B. Milner, Sec. Lt (Hon. Lt.) J. S. Oliphant, Lt. H. E. F. Parkinson (Lt., R.A.S.C., T.F.), Sec. Lt. J. C. Petty, April 15th.

Captain O. Greig relinquishes his commn. on account of ill-health, and is permitted to retain his rank, April 16th.

The following Capts. relinquish their commns :—H. M. T. Lehmann (on account of wounds contracted on active service), W. T. Wood (Nova Scotia R.) (on account of ill-health), April 16th, 1918.

Capt. P. G. Taylor resigns his commn. at own request, March 31st.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—W. T. J. Hall, O. A. Moore (contracted on active service), H. J. Walkerdine (contracted on active service), April 16th.

The following Lts. relinquish their commns. on account of ill-health :—(Hon. Capt.) H. P. Smith (Border R.), R. H. Stacey, April 16th.

Sec. Lt. (Hon. Capt.) L. N. Robinson relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain the rank of Capt., April 16th.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—E. R. Wallington, C. A. Robotham, W. S. Spark (contracted on active service), W. Susman (caused by wounds), F. W. Savignac (contracted on active service), April 16th.

Sec. Lt. C. McD. de Nobriga is removed the Service, his Majesty having no further use for his services as an officer, Dec. 16th, 1918.

The date of appt. of Lt. J. B. V. Clements, D.F.C., is May 2nd, 1918, and not as in "Gazette," March 7th.

Lt. S. Horscroft, M.C., is as now described and not Sec. Lt. S. Horscroft, as in "Gazette," April 8th.

The surname of Lt. W. S. Birkett is as now described, and not as in "Gazette," April 1st.

The notification in "Gazette," April 11th concerning Lt. F. W Marshall is cancelled.

The rank of Sec. Lt. V. T. Harwood is as now described, and not Lt., as stated in "Gazette," March 28th.

The rank of Sec. Lt. H. Hartley is as now described, and not Lt., as stated in "Gazette," March 28th.

The notification in "Gazette," Jan. 28th concerning Sec. Lt. C. B. Gibson is cancelled.

The notification in "Gazette," April 1st concerning Sec. Lt. R. W. Brigstock is cancelled.

The notification in "Gazette," March 25th concerning Lt. F. Fowler is cancelled.

The Christian names of Sec. Lt. Daniel Barri Jones are as now described, and not as stated in the "Gazette," Nov. 1st, 1918.

The notification in the "Gazette," Feb 4th concerning Sec. Lt. F. H. Alder is cancelled.

The surname of Lt. A. D. Riches is as now described, and not as stated in "Gazette," March 14th.

The notification in the "Gazette," April 1st concerning Lt. J. Hirst A.F.C., is cancelled.

The notification in the "Gazette, March 28th concerning Lt.- (actg. Capt.) S. W. Highwood, D.F.C., is cancelled.

Administrative Branch.—G. Dyson is granted a temp. commn. as Maj., March 10th.

Lts. to be actg. Capts. whilst empld. as Capts. :—J. E. B. Cochrane, Nov. 14th; (Hon. Capt.) F. F. McKenna, March 4th.

Lts. (A.) to be Lts.—W. H. Williams, March 18th; C. E. Walton, D. Watt, March 19th; (Hon. Capt.) L. F. Bettinson, (Hon. Capt.) (actg. Capt.) H. M Goode, and relinquishes actg. rank of Capt. March 25th.

Lt. R. R. Herring, M.C., to be Lt., from (O.), March 18th.

Sec. Lt. (Hon. Lt.) C. A. Luce to be Lt., Aug. 22nd, 1918.

The following Sec Lts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lts. :—R. M. Cobb, April 1st, 1918; H. Wagner, June 22nd, 1918; W. T. A. Jacob, Oct. 25th, 1918.

The following are transferred to the unemployed list :—Sec. Lt. H. C. Print, Jan. 20th; Lt. G. C. Bateman, Feb. 2nd; Sec. Lt. R. Biggin, Feb. 12th; Lt A. Ashurst, March 1st; Sec. Lt. D. McCulloch, March 2nd; Sec. Lt. B. Berry, March 4th; Sec. Lt. R. H. Blake, March 11th; Sec. Lt. H. F. Monypenny, March 17th; Sec. Lt. (actg. Lt.) R. E. Cunningham, March 22nd; Capt. C. A. K. Lord, Ossuiston, March 31st; Capt. T. J. S Naylor, April 1st; Sec. Lt. (actg. Lt.) L. S. Pape, April 4th; Sec. Lt. F. Mycock, April 6th; Lt. H. F. W. Bailey, April 7th; Sec. Lt. F. R. Cooke, Lt. (Hon. Capt.) A. B. Campbell, April 9th; Capt. H. A. Drewe-Mercer, April 10th; Lt. A. F. Corker, D.F.C., Capt. M. C. P. Hamer, April 11th; Sec Lt. T. Bateman, Sec. Lt. A. Chouffet, April 12th; Sec. Lt. E. W. Anderson, Capt. (act. Maj.) W. M. Urquhart, M.C., April 13th; Lt. V. G. Barry, Lt. A. J. Cassiday, Sec. Lt. C. E. Easton, Maj. F. Hill, Sec. Lt. (Hon. Lt.) (actg. Lt.) C. S. Marriott, April 14th; Sec. Lt J. S. Clarke, Sec. Lt. J. A. C. Allan, Lt. C. E. Bacon, April 15th.

Capt. H. M. Rushworth (Lond. R.) relinquishes his commn. on account of ill-health, April 16th.

Lt. W. Law relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Lt., April 12th.

Sec. Lt. F. W. Salmon relinquishes his commn. on account of ill-health and is permitted to retain the rank of Sec. Lt., April 16th.

Sec. Lt. H. W. Gallagher resigns his commn., March 15th.

The surname of Lt. B. Burton is as now described, and not Barton as stated in "Gazette," March 14th.

The surname of Lt. W. G. Hurrell, D.F.C., is as now described, and not Harrell as stated in "Gazette," Feb. 4th.

The "Gazette" notice of March 4th concerning Sec. Lt. J. F. George is cancelled.

TECHNICAL BRANCH.—Lt. (actg. Maj.) T. L. F. Burnett to be Lt., and to retain the actg. rank of Maj. whilst empld. as Maj., from (S.O.), April 1st.

Lt. (actg. Capt.) H. H. Greig to be Lt., and relinquishes the actg. rank of Capt. on ceasing to be empld. with British Naval Mission, March 14th.

Lt. C. A. Brook to be Lt. (Grade A.), from (O.), Nov. 7th, 1918.

Lt. T. Foster to be Lt. (Grade B.), from (O.), March 24th.

Lts. to be Lts. (Grade B.), from (Ad.):—S. H. Pickles, J. D. Davidson, A. L. Stirk, March 24th.

Sec. Lt. G. Moon to be Lt., without pay and allces. of that rank, April 2nd, 1918.

Sec. Lts. to be Sec. Lts. (Grade B.), from Ad.):—G. W. Webb, Dec. 20th, 1918; F. W. Pridham, March 24th.

Sec. Lt. W. J. Lee-Bird (Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt. (Grade B.), Jan. 14th

The following are transferred to the unempld. list:—Sec. Lt. C. Macpherson, Jan. 10th; Lt. P. Eadie, Jan. 30th; Lt. R. L. Brown, Feb. 5th; Capt. W. H. F. Mattinson (Cent. Ontario R.), Sec. Lt. (Hon. Lt.) J. C. R. Watson, Feb. 25th; Lt. (actg. Capt.) F. Avison (K. Lancs. R., T.F.), Feb. 28th; Sec. Lt. H. R. Mayes, Capt. A. Orr, March 4th; Lt. (actg. Capt.) N. McGregor (A. and S. Highrs.), March 15th; Sec. Lt. (actg. Lt.) F. E. Miles, March 19th; Maj. R. V. Mostyn, March 20th; Lt. N. E. Beal, March 24th; Lt. E. E. Cutts, Lt. R. S. Eachus, March 30th; Lt. A. R. B. Gill, March 31st, Sec. Lt. E. B. Cooke, Sec. Lt. W. A. A. Joyner, Sec. Lt. (actg. Lt.) H. A. Paton, Lt. H. R. Soutter, April 1st; Sec. Lt. H. Cooper, April 2nd; Sec. Lt. A. O. Binding (A.F.C.), Sec. Lt. A. E. Coyne, Lt. P. R. Aitken, Maj. E. N. G. Morris, April 3rd; Sec. Lt. B. T. Auckland, April 5th; Lt. (Hon. Capt.) C. F. Cape, April 6th; Lt. O. Clayton, April 9th; Lt. W. T. Kanaar, April 12th; Lt. G. S. B. Fuller, April 13th; Sec. Lt. (actg. Lt.) G. E. Barnett, Lt. S. B. Hensman (E. Kent R., T.F.), April 14th.

Capt. A. D. Wigram relinquishes his commn. on account of ill-health, and is permitted to retain his rank, April 16th.

The following Lts. relinquish their commns. on account of ill-health and are permitted to retain their rank:—J. Southall (contracted on active service), C. W. Ware, April 16th.

Sec. Lt. T. L. Bowen is dismissed the service by sentence of a Gen. court martial, Dec. 19th, 1918.

Sec. Lt. E. L. Hoffman relinquishes his commn. on account of ill-health, and is permitted to retain his rank, April 16th.

The surname of Lt. J. Elgood is as now described, and not as J. E. Good as stated in "Gazette," March 7th.

MOTOR-BOAT BRANCH.—Capt. A. H. Mackenzie is transferred to unempld. list, March 29th.

MEDICAL BRANCH.—H. Gardiner-Hill, M.B.E. (T./Capt., R.A.M.C.), is granted a temp. commn. as Capt., Oct. 1st, 1918, seny. from April 1st, 1918.

The following are transferred to unempld. list:—Capt. B. Maclean, March 8th; Lt.-Col. G. N. Biggs, M.B., March 13th.

DENTAL BRANCH.—The following are transferred to unempld. list:—Sec. Lt. D. Campbell, March 28th; Capt. C. J. Crocker, March 29th.

CHAPLAINS BRANCH.—The Rev. N. I. Bicknell, M.A., is transferred to unempld. list, Feb. 24th.

MEMORANDA.—Lt. W. C. Alexander to be Hon. Capt. June 2nd, 1918.

The following relinquish their commns. on ceasing to be empld.:—Maj. J. L. Baird, C.M.G., D.S.O., M.P. (Scot. Yeo., T.F.), and is permitted to retain his rank, Jan. 14th; Lt. G. H. Wadsworth, March 16th; Lt. J. A. Whyte, March 31st.

The following are transferred to the unempld. list:—Capt. (actg. Maj.) H. R. Coningsby (S.O.), Feb. 1st; Capt. S. J. A. Beale (S.O.), Feb. 22nd; Capt. (actg. Maj.) J. T. North, O.B.E. (S.O.), March 27th; Maj. (actg. Lt.-Col.) E. P. A. Melville, O.B.E. (S.O.), April 1st; Capt. (actg. Maj.) P. G. Beachcroft, M.C., G.A., Spec. Res. (S.O.), April 2nd. Capt. R. G. Blakesley, April 4th; Lt. W. D. Cairns, from S.O., April 5th; Maj. R. Addenbrooke-Prout, O.B.E., M.C. (S.O.), April 6th; Capt. (actg. Maj.) W. L. Birch, M.B.E. (S.O.), April 7th.

Capt. H. O'N. De H. Segrave (Lt., R. War. R.) relinquishes his commn. on account of ill-health, April 16th

Lt. (Hon. Capt.) McD. Turner relinquishes his commn. on account of ill-health (S.O.), April 16th.

The "Gazette" notice of March 28th concerning Capt. A. W. Dods is cancelled.

AIR MINISTRY, April 18th.

R.A.F.—The following temp appointment is made at the Air Ministry:—Deputy Chief of the Air Staff.—Col. (actg. Brig.-Gen.) R. M. Groves, C.B., D.S.O., A.F.C., and to retain the actg rank of Brig.-Gen while so empld., March 12th

The following temp. appointments are made, graded for pay at Air Ministry rates:—

Brig.-Gen., Air Staff.—**Col. (actg. Brig. Gen.) J. M. Steel, C.B.E., and** to retain the actg. rank of Brig.-Gen. while so empld., March 12th.

Staff Officer, 2nd Cl. (T.).—Capt. (actg. Maj.) P. G. N. Ommanney, and to retain the actg. rank of Maj. while so empld., 3rd; Capt. (actg. Maj.) R. S. Booth, and to retain the actg. rank of Maj. while so empld., March 20th; Capt. V. A. Watson, March 20th.

The following temp. appointment is made:—Brig.-Gen.—Col. (actg. Brig.-Gen.) O. Swann, C.B.; and to retain the actg. rank of Brig.-Gen. while so empld., April 2nd.

Staff Officer, 1st Cl. (T.).—Maj. (actg. Lt.-Col.) R. Hall, M.B.E., Sept. 13th, 1918.

Staff Officers, 3rd Cl. (T).—Capt. H. H. Clarke, March 26th; (T) (Air) Lt. (actg. Capt.) S. J. Stocks, and to retain the actg. rank of Capt. whilst so empld., Nov. 14th, 1918

Air Attaché.—Lt.-Col. C. H. Meares, Dec. 1st, 1918

FLYING BRANCH.—Capt. W. E. Molesworth, M.C., to be actg. Maj. whilst empld. as Maj. (A.), Sept. 3rd, 1918.

Capt. (actg. Maj.) S. E. Adams to be Capt. (A.), and relinquishes the actg. rank of Maj. on reduction of establ., March 28th

Capt. J. W. Wood, A.F.C., to be graded for purposes of pay and allowances of Capt. whilst empld. as Capt. (A. and S.), April 1st, 1918.

Lt. (actg. Capt.) R. C. Kean to retain the actg. rank of Capt. whilst empld. as Capt. (A.) from (T), Dec. 10th, 1918.

Lt. J. W. Young to be actg. Capt. whilst empld. as Capt. (A and S.), Aug. 5th, 1918.

Lts. (actg. Capts.) relinquish the actg rank of Capt. on ceasing to be empld. as Capts. (A.).—(Hon Capt.) H. S. Quigley, M.C., March 24th; N. G. Fraser, A.F.C., April 11th.

Lts. (actg. Capts.) to be Lts. (A.) and relinquish the actg. rank of Capt. on reduction of establ.—A. L. Coffe, A. E. Cowper, M.C., A. H. Curtis, R. J. Housden, J. B. Henry, E. S. Meek, N. L. Robertson, F. L. Spraul, N. R. Smuts, R. A. Way, P. Wilson, M.C., G. T. Williams, March 25th; C. W. Busk, M.C., P. H. Cummings, D.F.C., W. R. Cox, M.C., H. Haycock, M.C., J. S. Harvey, J. H. P. McEwen, H. N. C. Robinson, H. C. Senior, D.F.C., F. H. St. C. Sargant, D.F.C., C. J. Thompson, A.F.C., March 27th; R. E. Dodds, D.F.C., March 29th.

Sec. Lt. H. Bardsley to be Lt., Nov. 18th, 1918.

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. C. C. Walmsley (Lt., Essex R.), Aug. 28th, 1918, Maj. B. F. Vernon-Harcourt (Maj., Welsh R.), April 7th.

The following are transferred to unempld. list:—Lt. R. J. W. Palmer, Jan. 19th; Capt. A. M. Wynne, Jan. 24th; Lt. A. G. Viasto, R.G.A., Jan. 31st; Sec. Lt. A. C. Scarr, Feb. 2nd; Lt. G. A. Pitt, Feb. 4th; Sec. Lt. G. P. McCraig, Lt. S. E. Towill (Yorks. Hrs.), Feb. 6th; Sec. Lt. A. Macdonald, Feb. 9th; Sec. Lt. J. E. B. Skinner, Feb. 12th; Sec. Lt. (Hon. Lt.) H. L. Arnott (W. Rid. R., T.F.), Feb. 23th; Lt. B. Smith, Feb. 15th; Lt. J. S. Hopper, Feb. 19th; Sec. Lt. S. W. Jackson, Feb. 23rd; Lt. W. Williamson, Feb. 25th; Lt. D. Francis, Feb. 26th; Sec. Lt. G. V. Kitson, Feb. 27th; Sec. Lt. (Hon. Lt.) R. L. Astin (Lond.R., T.F.), Feb. 28th; Lt. A. D. Drew, March 4th; Lt. A. Hopkins, M.C., March 5th; Sec. Lt. G. F. Custance, March 7th; Lt. F. W. Addison, March 12th; Lt. G. Andrews, March 15th; Lt. G. Austin, March 22nd, Sec. Lt. P. E. Tottle, March 23rd; Sec. Lt. L. J. Williams, March 25th, Lt. J. N. Bickner, Mar. 20th; Sec. Lt. L. W. Thres, D.F.C., March 27th; Sec. Lt. H. A. Young, March 28th; Sec. Lt. W. S. Ruddock, March 31st; Sec. Lt. R. S. Asher, Lt. R. E. Duke, Sec. Lt. H. H. Davies, Maj. C. H. Drabble, Lt. F. R. Dawson, Sec. Lt. L. W. Sage, April 1st; Lt. (Hon. Capt.) N. J. Allgood (Northumb. Fus.), Sec. Lt. J. R. Brown, D.F.C., Sec. Lt. K. Curry, Sec. Lt. M. J. Clark, Sec. Lt. B. M. Evans, Sec. Lt. H. Greer, Lt. A. D. Gledhill, Lt. (actg. Capt.) J. Parry, Sec. Lt. G. Pickup, Sec. Lt. R. McK. Soulby, Lt. W. H. Scott, Lt. O. E. Worsley, April 2nd; Sec. Lt. J. H. Adams Capt. S. G. Beare, Sec. Lt. H. S. Batting, Sec. Lt. W. Day, Lt. (actg. Capt.) H. F. L. Mavity, Lt. G. G. Preston, M.C. (R.G.A.), Sec. Lt. J. D. Parker, Lt. J. E. Sharp Sec. Lt. H. C. Tombs, Lt. B. C. W. Windle, April 3rd; Lt. A. T. Adams, Lt. J. B. Blackett, Sec. Lt. H. W. Bate, Lt. J. D. Coomber, Lt. R. I. Dodd, Maj. Lt. F. L. Milner, Capt. W. Tesh, Sec. Lt. T. T. Williams, Lt. J. L. Wingate, Sec. Lt. G. F. Young, April 4th; Sec. Lt. L. R. Backhouse, Sec. Lt. W. J. Bird, Sec. Lt. R. A. Cully, Lt. E. W. Carmichael, Sec. Lt. C. T. Dawson, Lt. M. K. Denning, Sec. Lt. J. S. Dixon, Sec. Lt. R. Fittes, Lt. A. W. Stevenson, D.F.C., Sec. Lt. H. M. Lamb, Sec. Lt. A. Woodhead, Lt. R. R. T. Waring, April 5th; Lt. R. L. Crane, Capt. (actg. Maj.) W. R. B. McBain, M.C. (R.F.A., T.F.), Sec. Lt. R. C. Michaelson, Lt. H. Spurrier, Lt. E. C. Willis, April 6th; Sec. Lt. C. W. Browell, April 7th; Sec. Lt. J. McA. Allan, Sec. Lt. J. E. Motion, Lt. D. L. H. Moore, Lt. (actg. Capt.) C. M. Maud, Lt. D. L. Pgdfield, Sec. Lt. J. Pgdfield, Sec. Lt. J. Bromilow, April 8th; Lt. J. B. Davies, Capt. G. A. Gooderham, Sec. Lt. R. A. D. Jones, April 9th; Sec. Lt. W. N. Ashburner, Sec. Lt. E. P. Brown, Lt. A. P. Darlow, Lt. (Hon. Capt.) R. M. A. Edlundh, Lt. D. F. Gibbons, April 10th; Lt. (actg. Capt.) O. C. Bridgeman, M.C., Lt. D. C. Burgess, Sec. Lt. L. H. Day, Lt. A. Whitehead, Lt. R. T. Twining, Lt. J. T. Bosanquet, Lt. C. F. Frank, D.F.C., Lt. J. O. Hawley, Lt. K. N. King (E. Surr. R.), April 12th; Sec. Lt. J. A. Arnott, Lt. G. H. Bastin, Lt. J. Boydell, Sec. Lt. O. V. Crawford, Sec. Lt. P. R. Davis, Sec. Lt. C. H. Dickens, Sec. Lt. R. R. Drysdale, Lt. J. C. Douglas, Lt. G. A. Firby, Sec. Lt. J. P. Fisher, Sec. Lt. E. J. Ellis, Lt. A. Hall, Sec. Lt. J. Hall, Lt. W. A. Bonney, April 13th; Lt. (actg. Capt.) S. Anderson, D.F.C., Lt. E. S. Chantrell, Sec. Lt. L. Dexter, Sec. Lt. C. E. Eastgate, Sec. Lt. B. B. Everitt, Sec. Lt. H. W. Freshney, Lt. L. L. Falck, Sec. Lt. F. C. Grundy, Sec. Lt. K. M. McGregor, Sec. Lt. A. L. Wright, April 14th; Lt. A. M. Alexander, A.F.C., Sec. Lt. J. H. T. Ashburner, Lt. A. E. C. Andrews, Sec. Lt. W. N. L. Cope, Lt. J. S. Cassels, M.C., Sec. Lt. S. H. Coventry, Lt. C. T. F. Chamberlain, Lt. J. Cross, Lt. F. G. Carpenter, Lt. T. L. Crouch, Sec. Lt. J. W. Dempsey, Lt. H. F. D. Delves, Sec. Lt. F. Dummer, Lt. J. E. Dumbleton, Lt. M. L. J. Daly, Lt. E. E. Elliott, Sec. Lt. J. Groves, Sec. Lt. H. W. Howes, Sec. Lt. G. R. Iles, Sec. Lt. G. P. MacDonald, Lt. N. E. Parkes, Sec. Lt. E. E. Rump, Sec. Lt. W. F. Wheeler, April 15th; Sec. Lt. R. G. W. Baker, Sec. Lt. L. Clark, Lt. (actg. Capt.) J. M. Chaundler, Sec. Lt. F. H. Foster, Sec. Lt. W. T. Edmunds, Sec. Lt. M. H. Edmunds, Lt. E. M. Forsyth, M.C., Sec. Lt. E. A. Hardiman, Lt. R. G. Holt (E. Lancs R., T.F.), Sec. Lt. L. T. Lawrence, Sec. Lt. C. Piper, April 16th; Lt. G. B. Nanavatanath, Sec. Lt. A. R. Barrett, Sec. Lt. J. C. Bradford, Sec. Lt. F. C. Bradley, Lt. (actg. Capt.) L. P. Coombes, D.F.C., Sec. Lt. C. S. Cooper, Sec. Lt. F. Cartwright (R.F.A.), Sec. Lt. A. W. T. Chudley, Lt. (Hon. Capt.) W. E. J. Detmold, Sec. Lt. C. H. F. Greene, Maj. A. C. Hagon, Sec. Lt. W. G. Harvey and Sub'd. Highrs.), T.F.), Sec. Lt. C. R. Jones, Sec. Lt. J. L. Muir, Sec. Lt. C. F. C. Mossey, Lt. C. A. McCreath, Sec. Lt. H. H. Durkis, Lt. E. G. Mattingley, April 17th; Lt. G. F. M. Apps, Sec. Lt. I. A. Bailey, Sec. Lt. C. D. Frogbrook, Lt. R. Gray, Capt. W. J. Henney, Lt. J. E. Johnston (Huntingdon Cyclist Bn., T.F.), Sec. Lt. R. A. Mewburn, Lt. N. McCirrick, Lt. (actg. Capt.) J. A. Middleton, M.C. (R.F.A., T.F.), Sec. Lt. D. H. Mansfield, Lt. E. R. Pemberton, Sec. Lt. G. B. Powell, A.F.C., Lt. A. J. Winstanley, Sec. Lt. V. Williams, April 18th.

Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—H. B. Davis, March 30th. (Substituted for notification in "Gazette," Dec. 17th, 1918.) H. Brandes, April 6th. (Substituted for notification in "Gazette," Jan. 24th.) C. A. Barry (caused by wounds); J. J. Lanctot (contracted on active service); W. J. Saunders (caused by wounds); T. C. Wilson (caused by wounds); W. T. Warren (contracted on active service), April 19th.

Lts. relinquish their commns on account of wounds:—J. M. R. Miller (Ac. Inst.), P. D. McIntosh (Quebec R.), April 19th.

Lts. relinquish their commns. on account of ill-health:—W. B. Swart, April 16th. (Substituted for notification in "Gazette," Oct. 22nd, 1918.) H. W. White (R.G.A.), April 19th.

Lt. F. G. Ibbett is removed the Service for absence without leave, Nov. 7th, 1918.

Sec. Lt. (actg. Capt.) H. G. Clappison relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Capt., April 15th.

Sec. Lt. L. S. Potter relinquishes his commn on account of ill-health contracted on active service, and is permitted to retain his rank, April 10th

Sec. Lt. R. C. Hockey relinquishes his commn on account of ill-health, April 19th.

Sec. Lt. G. T. Porter is antedated in his appt as Sec. Lt. (A.), Aug 7th, 1918.

The Christian names of Sec. Lt. Edward Gordon Warren are as now described, and not Gordon Edward, as stated in the "Gazette" of Aug. 20th, 1918, page, 9,702.

The surname of Sec. Lt. W. Coogle is as now described, and not Goagle, as stated in the "Gazette" of Dec 10th, 1918, on page 14,573.

The initials of Lt H. C. Murray are as now described, and not H. C. C. Murray, as stated in the "Gazette" of March 18th.

The initials of Lt. W. H. Naylor are as now described, and not W. W., as stated in the "Gazette" of March 7th.

The initials of Lt. G. R. Hurst are as now described, and not C. R., as stated in "Gazette" of April 1st.

The notification in the "Gazette" of March 18th concerning Lt. A. Jackson is cancelled.

The notification in the "Gazette" of March 21st, concerning Lt. P. G. Ashford is cancelled

The Christian names of Lt. Archibald Elsden Smith, D.F.C., are as now described, and not A.E., as in "Gazette" of Jan. 14th.

The Christian names of Lt. Austin Edward Smith, D.F.C., are as now described, and not A. E., as in "Gazette" of March 26th.

The notification in the "Gazette" of March 28th, concerning Lt. H. J. Jewell is cancelled ("London Gazette" notice of March 11th to remain).

The notifications in the "Gazette" of March 28th concerning Sec. Lt. S. W. Jackson are cancelled.

The notification in the "Gazette" of March 7th concerning Lt. J. S. Hoper is cancelled.

The notification in the "Gazette" of Jan. 17th concerning Lt. R. B. Bevor is cancelled.

The initials and surname of Sec. Lt. W. J. Goodey are as now described, and not W. T. Goodney, as stated in the "Gazette" of Dec. 10th, 1918, page 14,574.

Administrative Branch.—Capt. W. T. F. Holland, A.F.C., to be Capt. and to relinquish the actg. rank of Major on ceasing to be empld. as Major, from (A.), March 5th.

Lt. J. F. Battersby to be Hon. Capt., Dec. 14th, 1918.

Lt. F. Paterson to be actg. Capt. whilst empl'd. as Capt., Nov. 22nd, 1918.

Sec. Lts. to be actg. Capts. whilst empl'd. as Capts :—(Actg. Lt.) A. E. Boyce, Oct. 24th, 1918. (Actg. Lt.) E. Bentley, Nov. 1st, 1918; G. L. Grey, from (A.), March 28th.

Lts. relinquish the actg. rank of Capt. on reduction of establishment: E. S. B. Tavener, March 25th; G. A. Hutchinson, March 27th.

Lts. (actg. Capts. A.) to be Lts., and relinquish the rank of Capt. on ceasing to be empld. as Capts. :—H. R. Eycott-Martin, M.C., Jan. 17th; W. E. Green, D.F.C., Feb. 12th.

Lts. (A.) to be Lts. :—C. H. Williams, Jan. 7th; C. Wilderspin, Jan. 28th; H. E. R. Twamley, Jan. 20th; C. H. Denny, R. F. Overbury, Feb. 10th; J. Burness, Feb. 27th; T. Elder Hearn, March 5th; F. E. Vipond, March 28th; R. A. W. Powell, S. Yates, J. A. Pugh, March 31st; A. Baird, J. V. Hunt, L. P. Wallis, April 1st; A. Leslie-Moore, W. Wallace, M.C., April 7th.

Capt. F. C. F. Walwyn to be Lt., from (O.), March 27th.

Lt. W. Gaunt to be Lt., from (O.), March 20th.

The following are granted temp. commns. as Lts. :—H. H. Marks, M.C. (Lt., Durh. L.I.), April 21st, 1918, sen. from April 1st, 1918; G. G. Raphael, (Lt., Lond. R.), May 17th, 1918, sen. from April 1st, 1918.

Sec. Lt. (actg. Lt.) J. W. Hustwaite to retain the actg. rank of Lt. while empld. as Lt., from (S.O.), April 1st.

Sec. Lts. to be Sec. Lts. from (A.) :—K. Wiggins, March 6th; D. A. MacDonald, and to be Hon. Lt., C. F. Purday, M. J. Moffat, March 27th. H. T. Hempsall, March 28th; W. Badger, March 31st; R. W. Davis, April 1st; G. Jacob, April 2nd.

Sec. Lt. J. C. Tyler to be Sec. Lt., from (A. and S.), Jan. 2nd.

Sec. Lts. to be Sec. Lts., from (O.) :—L. F. H. Bird, Nov. 27th, 1918; A. J. Baxter, Dec. 19th, 1918; G. A. McGillivray, Jan. 27th. H. T. G. Robey, Jan. 29th; J. M. S. MacPherson, Feb. 6th; C. J. M. Turner, Feb. 10th; P. D. Broughton, Feb. 27th. A. C. Fraser, March 6th; W. Tunstall, March 19th.

Sec. Lts. to be Sec. Lts., from (T.) :—R. Bushell, Jan. 14th; J. H. Woodgett, March 31st.

Lt. (actg. Capt.) Lord H. Cecil relinquishes his commn. on being elected M.P., Dec. 28th, 1918.

The following relinquish their commns. on ceasing to be empld. :—Lt. H. J. Priestland (temp. Lt., Loyal N. Lancs. R.), Aug. 9th, 1918; Capt. H. C. Lloyd, M.C. (temp. Capt., K.R.R. R.), Feb. 5th; Lt. C. Patrick (Lt., 16th Lancers), March 29th; Lt. (Hon. Maj.) J. Cemlyn-Jones (Maj., R.W. Fus., T.F.), March 27th; Lt. (Hon. Capt.), D. E. Mozley, M.C. (Capt., Glouc. R.), April 2nd.

The following are transfd. to unempld. list :—Lt. (actg. Capt.) A. C. Carter, Jan. 10th; Lt. G. S. McGregor, Jan. 13th; Lt. H. Saimon, Jan. 24th; Maj. D. M. Mackenzie, Feb. 21st, Lt. G. F. Randall, Feb. 28th; Sec. Lt. C. W. Warwick, March 5th; Sec. Lt. W. Yarwood, March 8th; Capt. E. D. Shearn, March 9th; Sec. Lt. (Hon. Lt.) J. C. Bain, March 11th (substituted for notification in "Gazette," March 28th); Sec. Lt. W. P. Wilks, March 27th; Lt. W. Woodward, March 31st; Sec. Lt. F. Fogg, April 1st; Lt. J. W. Amos, Lt. (Hon. Capt.) K. Nicholson (W. Riding R.), Capt. T. C. Spurway, April 2nd; Lt. W. S. De Ropp, April 4th; Capt. C. J. Dickinson, April 6th; Capt. S. Clare, April 7th; Lt. H. L. Ball, Sec. Lt. A. MacBean, April 8th; Capt. (actg. Maj.) G. H. K. Bone, April 9th; Lt. E. B. Ridsdel, April 10th; Lt. E. F. Dixon, April 11th; Lt. W. E. Gilbert, April 13th; Lt. D. S. F. E. Maule-Cole, April 15th; Lt. F. R. Hunt, April 16th; Sec. Lt. (Hon. Lt.) N. S. Beale, Lt. (Hon. Capt.) H. R. King (Durh. L.I. R.), April 17th.

Capt. P. Le G. Gribble relinquishes his commn. on acct. of ill-health, and is permitted to retain his rank, April 19th.

Capt. W. E. Birch (S. Lancs. R., T.F.) relinquishes his commn. on acct. of ill-health contracted on active service, April 19th.

Sec. Lt. C. Wallace resigns his commn., and is permitted to retain his rank, April 19th.

The "Gazette" notice concerning Sec. Lt. N. V. W. Lucas in "Gazette," April 1st, is cancelled.

Technical Branch.—Lt. W. S. Harms to be actg. Capt. while empld. as Capt., Grade (A.), (substituted for notification concerning this officer in "Gazette," Jan. 28th).

Lt. A. Dent to be Lt., Grade (A.), from (A.), May 27th, 1918.

Lt. A. L. C. Hartland-Rowe to be Lt., Grade (A), March 18th.

Lts. to be Lts., Grade (B.), from (Ad.) :—N. H. de V. Heathcote, Nov. 2nd, 1918 (substituted for notification which appeared in "Gazette," Nov. 22nd, 1918); O. Clayton, Dec. 30th, 1918 (substituted for notification which appeared in "Gazette," Jan. 21st).

Sec. Lt. (Hon. Lt.) (actg. Lt.) D. McK. Finlayson to be Lt., April 2nd, 1918.

Sec. Lt. (Hon. Lt.) G. T. Cain to be actg. Lt. whilst empld. as Lt., Grade (B), Oct. 14th, 1918.

Sec. Lt. A. W. Whistlecroft to be Sec. Lt., Grade (A.), from (Ad.), Dec. 1st, 1918 (substituted for notification in "Gazette," Feb. 4th).

Sec. Lt. (actg. Lt.) R. N. Tweedy to be Sec. Lt., from (Ad.), Sept. 2nd, 1918, and to retain the actg. rank of Lt. whilst empld. as Lt. (substituted for the notification in "Gazette," Oct. 29th, 1918).

To be Sec. Lts., Grade "A.," relinquishing the actg. rank of Lt. on reduction of establishment :—H. Weakley, W. F. Arnold, March 25th; M. F. Tomkins, March 27th.

Sec. Lt. C. B. Brown to be Sec. Lt., Grade (B.), from (Ad.), March 27th.

The following are transferred to the unempld. list :—Lt. H. C. Newton, Feb. 2nd; Lt. (actg. Capt.) (actg. Maj.) F. H. Austen, Feb. 9th; Sec. Lt. (Hon. Lt.) J. W. Anteliffe (Lt., Lancs. Fus., T.F.), Feb. 16th; Sec. Lt. J. Pritchard, March 1st; Lt. W. C. Green, March 8th; Capt. N. C. D. Colman, March 27th; Sec. Lt. (actg. Lt.) J. Darwen, Sec. Lt. H. J. Gaunt, April 1st; Sec. Lt. D. C. Buchan, April 2nd; Sec. Lt. T. W. Cummins, Sec. Lt. (actg. Capt.) H. V. Cherry, Lt. (actg. Capt.) H. H. Greig, Lt. R. E. Chadderton, April 3rd; Sec. Lt. P. H. Bayer, Lt. G. A. Crane, Sec. Lt. J. C. Gemmell, Lt. W. M. Metcalfe, April 4th; Maj. the Hon. A. V. Cave, Sec. Lt. (actg. Lt.) E. Lewis, April 5th; Capt. L. C. Abbott, April 7th; Sec. Lt. (Hon. Lt.) J. L. Burt, April 8th; Maj. H. B. T. Childs, Sec. Lt. (Hon. Lt.) (actg. Lt.)



YPRES.—An Official Aerial Photograph of the City of Ypres taken from a height of 1,100 ft.

M. Cohen, Lt. (actg. Capt.) G. McKerrow, April 9th; Lt. B. S. Cain, April 10th; Capt. S. E. Bowyer, Lt. R. A. Watson, April 11th; Lt. J. B. Holden, Sec. Lt. R. Mason, April 14th; Sec. Lt. (actg. Lt.) G. W. Cooke, Sec. Lt. (actg. Capt.) F. R. Assinder, Lt. E. L. Chadwick, April 16th; Sec. Lt. V. H. Kidney, April 17th; Sec. Lt. (actg. Lt.) P. B. Barlow, Maj. C. G. Coe, M.B.E., Lt. S. Williamson, April 18th.

Capt. H. Phillips relinquishes his commn. on account of ill-health, April 19th.

Lt. G. Shanks resigns his commn. at own request, April 19th (substituted for notice in "Gazette," April 4th.

Sec. Lt. R. A. G. Shepherd relinquishes his commn. on account of ill health, and is permitted to retain his rank, April 19th.

The Christian names of Lt. James Partington White are as now described, and not as stated in "Gazette," March 21st.

The Christian names of Lt. John Percival White are as now described, and not as stated in "Gazette," March 28th.

The notification concerning Lt. (actg. Capt.) F. M. Howard is as now described, and not Lt., as in "Gazette," March 18th.

The rank of Capt. A. R. Jackson is as now described, and not Lt. (actg. Capt.), as stated in "Gazette," March 18th.

The notification concerning Capt. A. Kennedy, which appeared in "Gazette," April 4th, is cancelled.

The notification concerning Sec. Lt. H. T. Savage, which appeared in "Gazette," March 21st, is cancelled, "Gazette" notice, March 28th, to remain.

Medical Branch.—Lt.-Col. E. C. Cridland relinquishes his commn. on ceasing to be empld., March 7th.

Sec. Lt. (actg. Capt.) L. W. Jones is transfd. to the unempld. list, March 8th.

The notification concerning Maj. L. L. Greig (Staff Surg., R.N.), which appeared in "Gazette," Nov. 26th, 1918, is cancelled.

Chaplains Branch.—Asst. Prin. Chaplain for Presbyterians.—Rev. W. P. Young, D.C.M. (Chaplain, 4th. Cl., A.C.D.), is granted a temp. commission as Chaplain, with the relative rank of Capt., and is granted the relative rank of Maj. whilst empld. as Asst. Prin. Chaplain, April 8th.

Memoranda.—F. J. Toulmin is granted a temp hon. commn. whilst specially empld. with the A.I.D., April 18th

The following relinquish their commns. on ceasing to be empld.:—Temp. Hon. Lt. M. Toinbs, Dec. 16th, 1918; Maj.-Gen. G. C. Cayley, C.B., April 4th.

The following are transfd. to the unempld list:—Capt. D. R. Parry-Jones, S.O., Feb. 20th; Capt. W. A. Johnson, S.O., Feb. 28th; Maj. G. V. Carey, S.O., April 1st; Capt. F. C. Townshend, (Rifle Brig.), S.O., April 3rd; Sec. Lt. (actg. Capt.) H. Sorrell, S.O., April 4th; Sec. Lt. V. L. Cockle, April 19th.

"Gazette" notice, April 1st, concerning Maj. E. A. Falconer is cancelled.

ADMIRALTY APPOINTMENTS.

The following appointments have been made:—

April 15th.—R.N.R.—Lieut. W. I. Lane, to "Pegasus" (undated).
April 19th.—Lieuts.—A. Ferguson to "Pegasus" (April 16th).
Engr. Sub-Lieut. (Temp.)—A. A. Joyce, to "Vindictive," (April 17th).
R.N.R.—Art. Engrs.—F. Hague, to "Vindictive"
Mid. (Temp.).—E. C. M. Morrell, to "Vindictive" (April 17th).

THE CASUALTY LIST.

AIR FORCE.

Reported April 16th.

Killed.—Bainbrigge, Capt. W. A. de L. Y.
Fenwick, Lt. F.
Thornton, Lt. F. O.
Died.—Bell, Sec. Lt. A. McC.
Wood, Maj. H. F.
Repatriated.—Macintyre, Lt. D. H.; Porter, Capt. G. Y. Withers, Lt. K. G.

Reported April 17th.

Correction.—Repatriated.—"Porter, Capt. G. Y., R.A.F." should read "Porter, Capt. G. T., R.A.F."

Reported April 19th.

Killed.—Burnay, Lt. P. S., R.A.F.
Ottewell, Lt. J. M., R.A.F.
Sullivan, Sec. Lt. F. H., R.A.F.
Died.—De Kock, Sec. Lt. D. W. F.A.F.
Jacobs, Lt. J. V. R., R.A.F.
McDonald, Lt. J. J., R.A.F.
Wells, Sec. Lt. S., R.A.F.
Died of Injuries.—Westall, Sec. Lt. A., R.A.F.
Repatriated.—Candy, Sec. Lt. F. B., R.A.F.; Coleman, Sec. Lt. O. E., R.A.F.; Freeman, Sec Lt. J., R.A.F.

PERSONAL NOTICES.

NAVAL.

Death.

STOCKER.—Flt. Sub-Lt. Edward Cuthbert Stocker, R.N.A.S., who was reported as missing is now presumed to have been killed on March 27th while flying near Dompierre. He was younger son and only surviving child of Major E. G. Stocker, R.A.M.C.T., and Mrs. Stocker, Carn Brea, Cornwall, and was 18 years of age.

MILITARY.

Death.

ATKINSON.—Capt. Rupert Norman Gould Atkinson, M.C., D.F.C., Croix de Guerre (Belgium), R.A.F., was the elder son of the late Mr. Brennan Atkinson, of Shanghai, China, and of Mrs. Atkinson, of High Kelton, Berkhamsted, Herts. He was born in 1896, and was educated at Otley Farm School, Harrow, and at Marlborough College (Preshute). He went up to Pembroke College, Cambridge, in June, 1914. In the following September he joined the 16th (Public Schools) Battalion, Middlesex Regt., and obtained his commission in the 15th Middlesex in December, 1914. On July 28th, 1915, he proceeded to Cameroon, where he was attached to the West African Regiment throughout the campaign. He was invalided home in April, 1916, and in August joined the Royal Flying Corps, and, obtaining his pilot's certificate, proceeded to the Western Front in November, 1916. He was gazetted Captain in July, 1917, becoming Flight Commander shortly afterwards. From November, 1916, till the Armistice Captain Atkinson was engaged almost continuously in artillery observation, photography, night-bombing, and low-flying machine-gun work. He received the Military Cross in 1917 for a daring and successful attack on enemy observation balloons; the Distinguished Flying Cross in 1918, and the Belgian Croix de Guerre in 1919, when he was also recommended for a bar to his D.F.C. He returned home on leave from Cologne at the end of February, and died of pneumonia, following influenza, on March 7th.

Engagement.

PARKER—URQUHART.—The engagement is announced between Lieut. the Hon. John S. Parker, East African Protectorate Force and R.A.F., second son of the late Lord Parker of Waddington and the Lady Parker of Waddington, of Aldworth, Haslemere, Surrey, and Marjorie, second daughter of Sir James and Lady Urquhart, Magdala House, Dundee.

Birth.

BOYD.—On April 16th, at 235, Cromwell Road, S.W.5, the wife of Major (acting Lieut.-Col.) J. M. Boyd, 8th Scottish Rifles and R.A.F., of a daughter.

AIR FORCE.

Deaths.

EVANS.—The body of Lieut. Walter George Evans, R.A.F., was washed ashore near Zeebrugge recently. Mr. Evans was last seen alive on June 27th, 1918, near Blankenberghe. He was engaged in an aerial fight with a German aviator.

RITCHIE.—Capt. Stanley E. Ritchie, R.A.F., who was killed on April 16th while flying, was the eldest son of Mr. and Mrs. E. Ritchie, Buckhurst, Dorking. He was 23 years of age.

Engagements.

ELIOTT-LOCKHART—WHIGHAM.—A marriage has been arranged, and will take place shortly, between Capt. Gilbert Eliott-Lockhart, R.A.F., youngest son of the late David Eliott-Lockhart, and Dora, only daughter of the late Rev. L. R. Whigham and Mrs. Whigham, Morden House, Guildford.

WHEATLEY—HODGKINSON.—An engagement is announced between Lieut. Eric S. Wheatley, R.A.F., younger son of Colonel H. S. Wheatley, C.B., I.A., and Mrs. Wheatley, of The Knoll, Farnham, Surrey, and Dorothy Hodgkinson, daughter of Dr. and Mrs. Hodgkinson, of Bradshaigh, Farnham, Surrey.

Marriages.

BANTING—LION.—On April 14th, at Christ Church, Lancaster Gate, H. W. Russel Banting, R.A.F., was married to Serena Phylis Lion, youngest daughter of John Lion, of Severn Lodge, Addison Road.

ST. GEORGE—LABOUCHERE-HILLYER.—On April 17th, very quietly, in London, Lieut. Leonard Durant St. George, R.A.F., of Wellington, New Zealand, was married to Mrs. Josephine Labouchere-Hillyer, of 4, Cornwall Mansions, Chelsea, widow of Mr. G. Labouchere-Hillyer.

Births.

ELLOR.—On April 17th, 1919, at 155, Stapleton Hall Road, N.4, the wife of Lieut. J. F. Ellor, R.A.F., of a daughter.

LIVINGSTONE.—On April 18th, at The Firs, Whyteleafe Road, Caterham, Jeanette, the wife of Capt. A. F. Livingstone, R.A.F., of a son.

* * *

To 85 Squadron, R.A.F.—Information is desired concerning the fate of Lieut. T. C. Martin, R.A.F., who left his aerodrome on August 12th, 1918, flying S.E 5 No. 6895, and was concerned in a fight with five German Fokker biplanes just to the north of Ypres. The local Anti-Aircraft Section report having seen him falling out of control, but no further information has been received concerning him. His father, Mr. G. C. Martin, General Traffic Manager, the Toronto, Hamilton and Buffalo Railway Co., Hamilton, Ontario, is anxious to get in touch with any officers of 85 Squadron, who were with the Squadron at that date, and who knew Mr. Martin. If this paragraph meets the eye of Lieut. W. E. W. Cushing, who was Recording Officer of 85 Squadron at the time, will he be good enough to write to Mr. Martin?

THE INDIAN MUTINY.

According to reports received from Gujranwala (Punjab), a crowd which attacked a passenger train and wrecked the station was dispersed by bombs and machine-gun fire from aeroplanes.

AN ATTEMPTED ESCAPE.

When Brunswick was liberated by the Government Forces, Herr Eichhorn, ex-President of the Berlin Police, attempted to escape from the city by aeroplane. Engine trouble was, however, experienced, and a forced landing was made near Holzminden. Herr Eichhorn was immediately arrested by the Government troops.

OFFICERS' PENSIONS AND GRATUITIES.

In the "Morning Post" of April 16th there appeared some strong criticism of the methods of granting officers' pensions and gratuities.

The writer complains that demobilised officers find it difficult to master the various orders and instructions that have been issued from time to time. He calls for a clear codification of all orders regarding officers' pensions, gratuities and educational and employment concessions to be published in the form of a pamphlet under the joint authority of the Admiralty, the War Office, the Royal Air Force, the Ministry of Pensions and the Ministries of Labour and Education.

One ventures to suggest that if all these authorities are to collaborate in the production of the pamphlet the oldest pensioner probably would have reached (one hopes) a better world before the publication of the work.

With some other remarks, however, one is inclined to agree. For instance, the writer of the article says :—"There is a bad old precedent at the War Office that a concession should be kept as secret as possible, so that a little money may be saved at the expense of officers, or their dependents, who do not know what they are entitled to. This precedent was set up in the old days by the Finance Branch, and seems to be explained by the argument that the officer of the Old Regular Army was supposed to be too rich to worry about trifles.

"An example of this bad old custom was the rule that a wound gratuity was not payable unless on application. Now, every officer should have the easy means of knowing all that he is entitled to, and the dependents of killed officers should have the means of knowing. The effects of a concession should be carefully studied before it is granted, with no saving idea that some of the cost will not be incurred through the ignorance of possible beneficiaries."

When the writer of the article turns his attention to the Air Ministry his tone becomes more bitter. He says :—

"As regards the War Office, there have not been many bad cases. F Branch has tried a niggling policy sometimes, but on the whole the W.O. has been fairly decent. The Air Ministry, on the other hand, until very recently has behaved like a dishonest corporation trying to shirk its just debts.

"A classic instance was that of the widow of a flying officer reported missing, who was refused both his pension and his pay. If she wanted a pension, her husband was alive; if she wanted his pay, her husband was dead.

"The Air Ministry has now turned over a new leaf, and is coming into line with the W.O. But for Air Force officers and their dependents, as well as for naval and military officers, a clear codification of benefits is necessary. The work could be done in a week, and should be done next week."

Frankly one admires the sublime optimism indicated in the last sentence. The work could be done in a week! Why, the Bolo alone would spend more than that time in writing "Passed to you, please" and "For your remarks" before the suggestion reached the right department. The mind staggers at the thought of the aeons that would elapse before all the other Ministries had been asked to express their views on the proposal.—P. A. B.

ENLISTMENT IN THE R.A.F.

The Air Ministry made the following announcement on April 18th, regarding the terms of recruiting for the R.A.F. :—

1. Recruiting for the R.A.F. will begin on Monday, April 28th.

2. Recruits are required in all trades, both technical, clerical, and non-technical.

3. Ages, 18 to 26.

4. Periods of enlistment :—Four years Regular service, eight years Reserve; five years Regular service, seven years Reserve; six years Regular service, six years Reserve; eight years Regular service, four years Reserve.

5. Pay.—Men enlisting will receive the present rates of pay, *plus* war bonus, until further orders. A revised scale of pay for the R.A.F. is now under consideration, and will shortly be published, and men will then (or at such later date as may be decided) be brought on to the rate of pay of their rank according to that scale, in lieu of present rates *plus* war bonus.

Separation allowance.—Men enlisting will be entitled to separation allowance under the existing rates and conditions, these rates and conditions being subject to revision.

6. For further particulars application should be made to any of the following recruiting depots :—4, Henrietta Street, Covent Garden, W.C.; 8, Tyndall's Park Road, Clifton, Bristol; 12, Newport Road, Cardiff; Carlton Chambers, Paradise Street, Birmingham; 8, George Street, Nottingham; 12, Abercromby Square, Liverpool; The Mount, Springfield Mount, Leeds; 10, Sydenham Terrace, North Road, Newcastle-on-Tyne; 9, Somerset Place, Sauchiehall Street, Glasgow. Men desirous of enlisting should apply to any of the above depots or to the nearest R.A.F. unit.

ATHLETICS IN THE R.A.F.

On a plateau near the Forest of Crecy the Royal Air Force sports tournament was begun on Thursday, April 17th. The programme consists of competitions in boxing, cross-country running, both Rugby and Association football, and tug-of-war. The competition is open to teams from each of the seven R.A.F. centres in France and the occupied regions.

On Friday, April 18th, the R.A.F. Rugby football team began a tour in Wales, and beat Neath by a goal and a try (eight points) to a try (three points).

A good game, of which the R.A.F. had the better during the latter part, was witnessed at Leicester on Saturday, April 19th, when the R.A.F. Rugby team played the Leicester fifteen. The concluding scores were: R.A.F., two goals and four tries (22 points), and Leicester, one goal and one try (8 points).

AUSTRALIAN AERIAL DEFENCE.

The Australian Government has completed a scheme of aerial defence, and proposes to establish various flying schools for aeroplane, seaplane and airship pilots. The initial expenditure will amount to £500,000, and the annual expenditure to the same amount.

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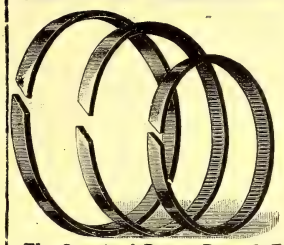
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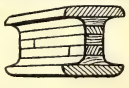
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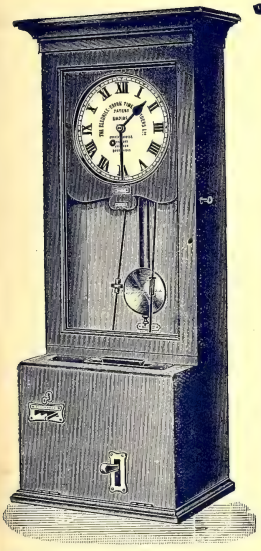
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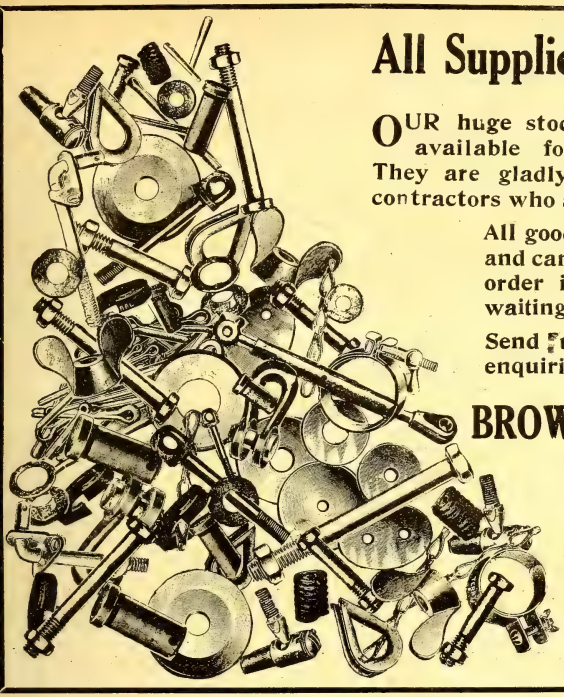
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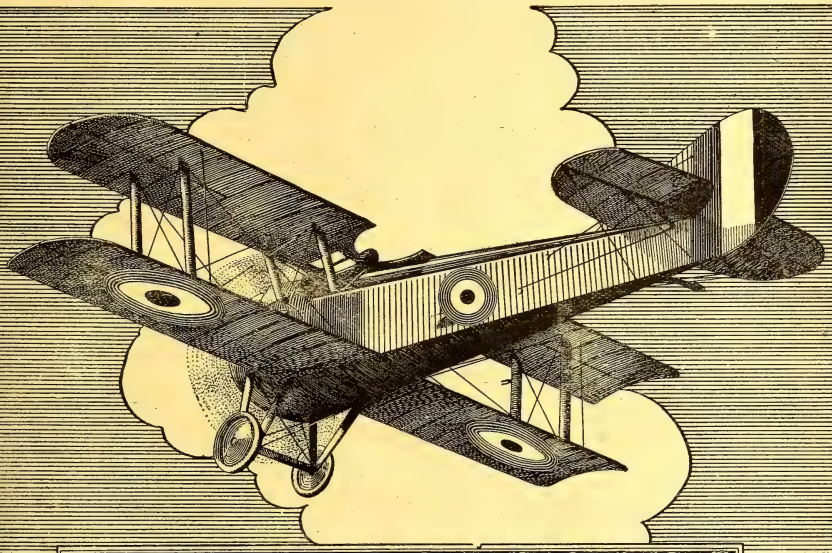


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ON THE TRADITIONS OF THE R.A.F. (II).

Permanent Commissions.

Though the anecdotes which were interpolated into the previous section of these notes may be purely imaginative, they do certainly illustrate existing defects in the constitution of the R.A.F., and one is fairly convinced that those in high places at the Air Ministry are not even now going to work the right way to remedy such defects. Discontent in the R.A.F. is growing, *esprit de corps* is diminishing, and the best men are leaving the Air Force just at the very time when the most strenuous efforts should be made to allay discontent and to raise *esprit de corps* by appealing more and more to the traditions of the past, and by keeping the very best men in the R.A.F.

In theory, no doubt, the principle on which permanent commissions in the R.A.F. and temporary commissions for aviators serving in the Army of Occupation are being given is excellent. One believes that the scheme in general is that officers holding permanent commissions in the Navy and Army shall have first claim on permanent commissions in the R.A.F. The underlying idea doubtless is that such officers have had proper service training in their youth and are therefore likely to import proper service tradition into the R.A.F.

This would be all very well if one could assume that all regular officers in the Navy and Army who apply for permanent commissions in the R.A.F. are officers of the best type in their respective Services. Unfortunately, such is far from being the case. It is perfectly true that a number of the regular officers in the R.A.F. are of the very finest type in the King's older Services, but it is unfortunately true that others of them are in the R.A.F. because they have managed to make themselves thoroughly unpopular in their own Services, or because, for one reason or another, their own Services were glad to get rid of them. And it is also unfortunately true that some of the very best regular officers in both Senior Services who have served with the R.A.F. are throwing up high ranks in the Air Force and going back to very much lower rank in their own Services because they are, in their own expressive language, "fed up with the Bolo House."

The First and Last Love.

Therefore one is by no means convinced of the soundness of making a hard and fast rule that regular officers are entitled *ipso facto* to permanent commissions in the R.A.F. It may very well be argued that a young, highly educated, intelligent, and energetic R.A.F. officer who came direct into either of the Flying Services from civilian life at the beginning of the war, who is by nature of the proper Service type—as many of them are—and whose only Service interests lie with the R.A.F., is in fact preferable to any but the very best of the officers of the Senior Services, of whom it is probably true, in the words of Miss Violet Lorraine, that "The first love is always the last love and the best love of all."

One would naturally feel rather suspicious of an officer brought up either in the Navy or Army who found it possible to feel the same affection for the R.A.F. that he did for his first Service. Therefore, while fully recognising the need for having regular officers of the Senior Services in the R.A.F. in order to impart to it the proper Service tone, one is by no means convinced that the possession of a regular commission should by itself constitute a right to a permanent commission in the R.A.F.

Public School Boys.

It is understood that after regular officers of the Senior Services, the people who have the next claims to permanent commissions are Public School boys of those Schools which are generally recognised as being in the first or second grade, but that many quite decent Public Schools are excluded from the recognised list. This again is as it should be in theory, for obviously a man with the better class of Public School education will make a better officer than one who has been brought up at a third-rate school or by a private tutor.

At the same time here again very great care is necessary in making a selection. A Public School education should by no means give a prescriptive right to a commission as against the claim of a candidate who, for some reason or another, has not had the good fortune to go to a Public School, although he may have been brought up by his parents in the Public School tradition.

Proved Air Fighters.

The third class, so far as one can gather, is composed of those who, no matter what their antecedents, have won two or more decorations in the field. Here again the idea is sound in theory, for it gives an absolute right to a commission to men of proved gallantry. But, as in the previous cases, very great care is necessary in making a selection, because some of the most gallant fighting men are by nature pirates rather than soldiers, and in time of peace are likely to give considerably more trouble than they are worth.

A Matter of Selection.

There is no doubt that by interpreting these general rules fairly liberally a very desirable class of officer may be obtained for permanent commissions in the R.A.F., but, even if one accepts them as a basis, one is by no means convinced that commissions are going to the right men.

Judging from examples within one's personal knowledge, it seems that commissions are being given in a purely arbitrary manner. And unless whatever body is supposed to be doing the work of the original Selection Committee—now apparently defunct—is very careful and also very skilful, the efforts of those in authority to make the R.A.F. worthy of the original idea that the R.F.C. was to be the *corps d'élite* of the British Army may result in its becoming a close corporation of an eminently undesirable kind.

A Matter of Money.

There is a very general impression throughout the R.A.F. that an officer has no hope of getting a permanent commission unless he has private means. It is commonly believed that the R.F.C. pay is to be cut down and that the standard of living is to be raised so that an R.A.F. officer will not be able to live on his pay, at any rate in the junior ranks, for he will be expected to keep a car and polo ponies.

One has seen this impression categorically denied in print, but it has not yet been denied officially by those in authority, and it is undoubtedly a fact that officers who have applied for permanent commissions have been asked whether they have private means. It is natural, therefore, that people should believe that a private income is a necessary qualification for a permanent commission.

One hopes that such is not the fact, for if the R.A.F. is to be run on such lines it will become a monument of financial snobbery similar to certain of the so-called crack cavalry regiments of the past. Moreover, there is no reason whatever to believe that the possession of money carries with it either personal gallantry or the amount of brains which are essential to a successful active-service aviator.

A Matter of Brains.

It is an incontrovertible fact that such an aviator needs more brains than the corresponding officer of the line if he is to be of real value in time of war. A platoon commander who knows something of the science of war is naturally a more useful man than one who is merely a good leader of men, but an officer may be quite a good platoon commander and yet not a particularly brainy individual.

The aviator on the other hand must possess brains. If he is to be a good artillery observer he must know practically everything there is to know about artillery, and he must know quite a great deal about the work of infantry and about the engineering side of war if he is to direct his battery with the best effect.

Similarly, if he is to be a good reconnaissance pilot or observer he must be able to read the movements of troops and must be able to judge what those movements indicate. So much was made perfectly clear by Major-General Sykes in various papers which he read before the war, and the experience of war has merely confirmed his theories.

The fighting aviator likewise must be a man of brains and of intense industry and application. One has only to read the late Major McCudden's account of his own work as a fighting pilot to understand thoroughly that industry and thoughtfulness go further towards successes in air fighting than does skill as a pilot or mere personal bravery.

What Is the Test?

Judging by very many instances within one's personal knowledge, those who have the handing out of permanent commissions, and of appointments to the Army of Occupation, have taken little or no trouble to discover whether applicants are people with brains and industry. In fact one knows that a number of extremely keen men with very good war records have been turned down, whereas some of those who have been accepted seem to have less qualifications for permanent appointments than some of those who have been unsuccessful in their applications.

It is even doubtful whether the R.A.F. will obtain the actual number of people required, judging by the proportion of people rejected. For example, one knows of one Squadron Commander who out of a matter of a hundred applications for permanent or temporary commissions recommended forty applicants who, of his own personal knowledge, he judged worthy of appointments. Much to his surprise two out of the forty were accepted and the rest received notice to be prepared to be demobilised within a fortnight. One has also heard of other instances where people have been rejected in very much the same proportion.

The Evidence of Figures.

Now we know that at the signing of the Armistice there were 30,000 officers in the R.A.F., and we have been told officially that 2,000 permanent commissions will be given at once and that some 6,000 or 7,000 temporary commissions will be given in the Army of Occupation.

It is probable that out of the original 30,000 at least 10,000 (at the most moderate estimate) have either been demobilised or have applied to be demobilised, so that at the very most there cannot be more than 20,000 officers who are at all likely to have applied for permanent or temporary commissions.

Of these, no doubt a number are ground officers who would like to have comfortable jobs without the danger of flying attached. And in their case, with very few exceptions in favour of experienced men who have done unusually good work during the war, they ought all to be rejected, because among the actual flyers it is quite possible to find enough men to do the ground jobs as well as the non-flyers, and they would have the advantage of being able to fly and so of being able to form a better judgment on technical matters concerning flying.

If these mere groundlings were rejected straight away there could scarcely be more than 15,000 officers, at most at all qualified for permanent and temporary commissions.

Now in all the cases of rejection of which one has heard, the applicants have been pilots, and if permanent commissions are only being given at the rate of two for every forty applicants it looks as if by the time the fell work is done there will be about 700 permanent commissions in the R.A.F. instead of 2,000.

Is the Selection Fair?

These figures are obviously absurd, and therefore one is forced to the conclusion that the selection of officers for permanent commissions is not being conducted fairly; that is to say, apparently an unduly high proportion of permanent commissions is being given to certain units and other units are getting practically no permanent commissions at all.

One can quite understand that the whole of a crack squadron now with the Army on the Rhine might be given commissions all round because they did well during the last month or two of the war. On the face of it this seems reasonable. But if one looks further into the matter, it is grossly unfair, because the chances are that the pilots and observers of such a squadron have only been away from England for a few months and probably have only been flying since the end of 1917 or the beginning of 1918.

The members of that squadron who built up the squadron's reputation, formed its traditions, and imbued it with its high moral are now probably dispersed over a number of training squadrons or home defence squadrons in England, and their applications for permanent commissions have probably been turned down just because they had not the luck to be actually at the front at the end of the war.

Yet individually those officers may be worth any two or three of the people who finished the war, for, be it remembered, the men who went through the bad times of 1916 and the men who fought through the great

German offensive of early 1918 had to be made of very much sterner stuff than those who maintained the command of the air through the last four months of the war.

The Need for an Announcement.

One suggests in all good feeling to the Air Ministry that a public announcement should be made as to the principle on which permanent commissions and temporary commissions in the R.A.F. are being given. The present state of mind of the officers of the Air Force is altogether bad for the moral of the Service. If money is to be the chief qualification for a commission, then the Air Ministry should say so, but if not, the idea should be denied officially and most emphatically.

If commissions are being given wholesale to certain squadrons and are being refused wholesale to people who have had the misfortune to come home for a well-deserved rest, then the fact should also be made clear. Those who cannot possibly be accepted would then be able to apply for demobilisation and would get out of the Air Force instead of hanging on in it feeling thoroughly disgusted and spreading an increasing feeling of discontent among the entire personnel.

If the authorities at present in charge cannot make a definite statement on the subject owing to the absence through illness of both General Trenchard or of his able Deputy-Chief of the Air Staff, General Groves, then let them state plainly that no decisions can be given until both officers return to duty. Then at any rate applicants for commissions will all be on the same level and there will be no legitimate cause for discontent. But infinite harm is being done by giving a few permanent commissions and leaving the majority of the officers in a most disturbed state of mental suspense.

If the position is made clear to all those officers who have not yet been actually demobilised, then they will certainly be content to wait and see what is going to happen to them. But the sooner the whole business is cleared up, and the sooner everybody is cleared out of the Air Force except those who are to remain in it permanently, the sooner the R.A.F. will be able to begin pulling itself together and reaching out after those high ideals which one hopes in all sincerity will, in due course, make it a Service worthy to rank with, but after, the King's Senior Armed Forces.

Demobilisation Muddles.

Another example of the way in which the High Authorities are causing irritation and raising bad feeling among the officers of the R.A.F. concerns the manner of demobilisation.

Those officers whose applications for temporary or permanent commissions have been refused, as well as the number of others who have neither applied for demobilisation nor for temporary or permanent commissions, have received notice to hold themselves "ready to be demobilised within twenty-eight days." The ambiguity of the wording of these notices is causing a large amount of ill-feeling.

Young officers do not understand whether it means that at any time during the twenty-eight days following the receipt of this notice they may receive orders to demobilise at once, or whether it means that at any time



THE OCHILL HILLS, near ALLOA.—This Photograph was taken from a G.3 Caudron Biplane (100 h.p. Anzani Engine) by M. R. L. Desoutter, flying from the Caudron Aerodrome alongside the Forth. The Proprietors of the Aerodrome state that the scenery is better than Italy, and that for a suitable fee a passenger can loop the loop over the perpetual snow of Ben Nevis.

for the next year or two they may receive instructions to demobilise at the end of twenty-eight days' notice. Some of them take it to mean that if they do not receive instructions to clear out of the Air Force during the ensuing twenty-eight days, they are free to leave without further orders when the twenty-eight days have elapsed.

The whole thing is an example of the muddle-headed way in which the Personnel Department of the Air Force is being run, and it shows the utter folly of mixing up Naval and Military methods in one department. In the Army it is clearly laid down by the War Office that any officer who is demobilised shall receive, after leaving his unit, twenty-eight days' clear leave on full pay, the intention being that he shall be at liberty to use those twenty-eight days in finding himself a job. As usual the War Office method is perfectly clear, perfecly reasonable, and perfectly understandable. Equally, as usual, the Air Ministry method—thanks probably to its amphibious origin—is thoroughly obscure, thoroughly muddled, and thoroughly devoid of reason.

Differences of Opinion.

The demobilisation of R.A.F. officers seems to be carried out in different ways in different areas. Some officers are simply sent home and told to await final instructions about demobilisation. Some of them are allowed to go to outside jobs, and are then, at the end of several weeks, hauled back to their original units for a day, perhaps at the other end of the British Isles, to be demobilised there. Some are given a month's leave, apparently on the responsibility of their individual C.Os., pending demobilisation, after the Army fashion. Some are kept hanging about their Stations doing nothing until the Personnel Department at the Air Ministry sees fit to deal with their papers.

The result is, of course, the creation of still more bad feeling and still more contempt for the incapacity of the high authorities at the Bolo House among the young officers of the R.A.F., who are the very people who ought to be handled in such a way as to inspire them with respect for those in authority, in view of the fact that ultimately they ought all voluntarily to join the R.A.F. Reserve.

Rear-Admiral Lambert, R.N., who, one understands, is responsible for the duties of Master-General of Personnel, may have been an excellent Fourth Sea Lord: one gathered at the time, however, that he was not particularly an admirer of the R.N.A.S. He may also be an excellent Quarter-deck Officer: one does not know. He may be an excellent Commander of seaplane units: and according to accounts from those who served under him in the Mediterranean he was in fact a very good Commanding Officer.

But it is pretty evident from the way in which the officer personnel of the R.A.F. has been handled for the last few months, and from the evident increase in the amount of discontent among the personnel owing to the way in which they have been handled more recently, either that Admiral Lambert is not the right man for that job (good as he may be in others), or else that he has been singularly unfortunate in the staff which he has chosen for his department or in the staff which was left to him as a legacy by his predecessor.

It is to be hoped that in the course of the next few days the Personnel Department will see fit to issue an announcement to the R.A.F. as a whole, setting forth the meaning of demobilisation orders as clearly as those which are issued by the War Office.

The Need for Charity.

It is quite possible that all one's impressions, as conveyed in the foregoing notes, may be entirely wrong. One hopes that they are. But the fact remains that those are the impressions held by the present officer personnel of the R.A.F. If they are wrong: and if commissions are being given according to a definite scheme of selection, intelligently operated: and if demobilisation is being carried out in a proper manner with due regard to the rights of the people who are being demobilised, nobody will be better pleased to hear that one is wrong than one will be oneself.

And if the Air Ministry sees fit to publish its intentions in a clear and concise manner, this paper will give the greatest possible prominence to the announcement.

As one has said before, one's most earnest desire is to see the R.A.F. become a force worthy of the highest traditions of the King's Services. It cannot become such a force so long as the officers and men are seething with discontent at the way in which they are being mishandled by the Air Ministry, and it is very much better that this state of discontent should be thoroughly ventilated than that it should be allowed to continue in a hushed-up state until it has ruined the *esprit de corps* of the R.A.F.—C. G. G.

PRINCE ALBERT, K.G.

Captain the Prince Albert, K.G., R.A.F., who is undergoing the ordinary course of instruction at the Wallington Aerodrome, near Croydon, is reported to be making good progress. H.R.H. the Prince of Wales, K.G., it is stated, occasionally accompanies the Prince Albert on the latter's flights. It is not the intention of the Prince of Wales to become a pilot.

GOOD NEWS.

It is reported that Major-General Sir Hugh Trenchard has made an excellent recovery from his recent serious illness and is expected to resume his duties as Chief of the Air Staff at any moment. The news will be the best possible to all who have the welfare of the R.A.F. at heart. It is hoped that as soon as he returns General Trenchard will lay down a fixed policy which will not be liable to alteration once a fortnight at the behest of the Harmsworth Press.

THE KING AND QUEEN OF BELGIUM.

While the King and Queen of the Belgians were flying on their way to visit the Belgian troops who have recently been sent to the left bank of the Rhine to constitute part of the Armies of Occupation, they were caught in a hailstorm near the German frontier. The King's machine landed near Düren, but later continued to Bochum, which it reached at 2.30 p.m.

The aeroplane in which the Queen was a passenger landed outside Liége, and reached Bochum at 1.30 p.m.

The King and Queen thence proceeded to Crefeld.

AERONAUTICAL HONOURS.

The list of honours, publication of which has been deferred since the New Year, was issued on April 29th. It includes the following:—

Central Chancery of the Orders of Knighthood.

St. James's Palace, S.W., April 29th, 1919.

The King has been graciously pleased to signify His Majesty's intention of conferring a Peerage of the United Kingdom on the following:—

Viscount.

The Right Hon. Harold Sidney, Baron Rothermere.

Controls the "Daily Mirror" and the "Sunday Pictorial." Director-General Royal Army Clothing Department, 1916-17. Air Minister, 1917-18.

[One would have imagined that the Air Ministry affair would have cancelled out against the Army Clothing success and that honours would have been easy. Apparently, "honours" are easier in politics than at cards.—Ed.]

The King has been pleased to signify His Majesty's intention of conferring a Baronetcy of the United Kingdom on the following:—

Samuel James Waring, Esq.

High Sheriff of Denbighshire. Public and local services. Within two months organised the largest tent and equipment factory in the world, employing 10,000 hands. Built, equipped, and organised factory and devised a new scheme known as the peddle system for expanding the production of the Lee-Enfield rifle. Organised factories throughout Great Britain for the production of aeroplanes.

[Sir Samuel Waring deserves every congratulation, and few baronetcies have been better earned. At the same time, one is moved to wonder why not a single one of the pioneers of aviation have received any honour of any kind. The O.B.E. can scarcely be reckoned an "honour" in these days.—Ed.]

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Paris Office: 21, RUE DU MONT THABOR.
Telephone—Central 80.44.

The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

The Reclamation of Brass Hats.

It seems that there is no truth in the rumour that the National Aircraft Factory at Owdham is to be started to work again on the job of reclaiming the gold from the headgear of de-brass-hatted Lieut.-Colonels and Majors who will be automatically demoted under the regulation to come into operation on May 1st, cancelling all "acting" ranks in the R.A.F. The reason for not using the said factory for the purpose is not that the material to be "reduced to produce" would be insufficient, but that the majority of the *dégomé* officers insist on retaining possession of their hats as a permanent reply to the question, "What did you do in the Great War, Daddy?"

The Scream of the Eagle.

An article published in the "Daily Express" begins in this staccato style:—

"Four hundred million pounds.

"Eight eighty-mile wide airways with feeders cris-crossing the North American Continent.

"Two hundred aerial mail routes, using two thousand aeroplanes, planning.

"That is America's challenge to the world in the air."

These phrases are not intended to be "college yells." They precede a description of the marvellous things that America is about to perform. The writer evidently is endeavouring to stimulate British manufacturers into activity, as he ends with the query, "And in all this—what is England doing?" The answer is, of course, that she is doing quite a lot while America is talking.

This interesting paragraph is worth quoting:—

"The average cost of sending . . . day and night letters is a dollar apiece, and 13 cents for the special delivery letters. That alone spells £10,000,000 waiting to be picked up. Further, the aerial letter is going to challenge the telegraph—it is a case of an 8d. letter versus a £1 telegram, and greater privacy."

One is not sure what "day and night letters" are, neither is it clear why one dollar apiece should be charged for them and only 13 cents for special delivery letters which are to rival £1 telegrams. The introduction of "an 8d. letter" in the final sentence causes more confusion. Thirteen cents is usually considered to be equivalent to 6½d., not to 8d.

Newspaper readers of average ignorance are likely to add to their store by perusing the article.

A Promenade-Decked Aeroplane.

According to a U.S. wireless message, Ifkor Sikorski, the Russian aviation expert, who has arrived at New York, announces that he "will enter the commercial air flying industry in the United States, manufacturing the 'Sikorski 28,' which design is an adaptation from the battleplane type used extensively by the Russians in heavy bombing during the war." A feature of the machine is a promenade deck on the lower wings for the use of adventurous passengers.

American reporters seeking sensational news find that there is no truth in the rumour that a band will perform on the promenade.

Nothing is said as to the means by which promenaders are to be attached to the planes.

More Silliness.

A writer in the "Daily Mail" has committed the following banality:—

"Flying does not interfere with the privacy of the ordinary citizen. Aeroplanes pass too high above his home and his garden for their passengers to quizz at him or annoy him. When aeroplanes land they can land only at proper landing places; their pilots do not descend voluntarily upon private property. Flying no more violates privacy than a railway line does at the end of one's garden.

"But what will a general extension of this parachuting mean? You can take it for granted that, just as everyone will soon fly, so everyone will soon parachute. That means the end of the legend that an Englishman's home is his castle. What is more annoying than to have unwelcome visitors 'drop in'? Everyone suffers from that affliction at times, but, at least, when the undesired visitors call at the front door, you can fob them off by telling a maid to say, 'not at home.'

"But how about when they have learned the trick of literally 'dropping in' to one's garden by a parachute?"

One might ask in the same inspired language: "How about when" this writer has learned the trick of dropping out of this literary style?

Theatrical Aerial Tours.

The daily news-sheets allege that Mr. Harry Tate, the famous motorist, is to tour the world per Handley Page Biplane (presumably Rolls-Royce engines) complete with scenery and "son" as fitted, and that he is to be accompanied by two pilots. It is not stated whether his stage assistants will act as aeroplane mechanics, or whether the pilots will do that job as well. At this rate one may expect to see advertisements for "pilot-mechanics wanted by famous actor-manager for company touring 'Hamlet.' Preference given to a couple willing to play First and Second Grave-Diggers and to act as scene-shifters and stage-carpenters when not flying"

The Height of Vulgarity.

In an American journal there appears an advertisement of an Aircraft Advertising Agency which announces its readiness to display advertisement on dirigible balloons, kite balloons, and aeroplanes, and to drop "souvenirs" and handbills from the air. The advertisement gives the names of various majors and captains who are in the conspiracy, and gives a précis of each aviator's services in the war. One is told that one representative of the Advertising Agency has twelve air victories to his credit.

Is it possible even for the American commercial mind to conceive anything more vulgar than this? One wonders if in the near future one will see business notepaper headed "Major Samuel Browne-Flapdoodle, the hero who brought down ten Huns in flames. Live advertising a speciality."

Horrible!

A Good Scheme.

A proposal is on foot to form an ex-Flying Officers' City Luncheon Club, and as an immediate beginning it is intended to arrange for a separate long table at one of the central City restaurants. Any ex-R.N.A.S., R.F.C., or R.A.F. pilots or observers who may now be demobilised and working in the City, and who are interested in the scheme, should communicate in the first instance by letter with Major Modin, Durrington Lodge, The Crescent, Surbiton.

The intention is to hold a meeting one evening in the City at an early date, when the scheme can be discussed and a Mess Committee nominated, etc.

The underlying idea is that there is now a very large number of ex-pilots and observers demobilised in the City of London who would welcome the formation of a luncheon club where they could meet old comrades and "talk shop" without annoying other people.

Mullet-Hunting with Seaplanes.

One commented recently in these pages upon the grisly possibilities of herring hunting with H.E. dropped from seaplanes. The "Scientific American," which is rarely (intentionally) humorous, treats the suggestion very seriously. This journal devotes much attention to a proposal of Professor Joubin, of the Oceanographic Institute in Monaco, who thinks that seaplane pilots can be of great use to fishermen. The following remark is made by the "Scientific American":—

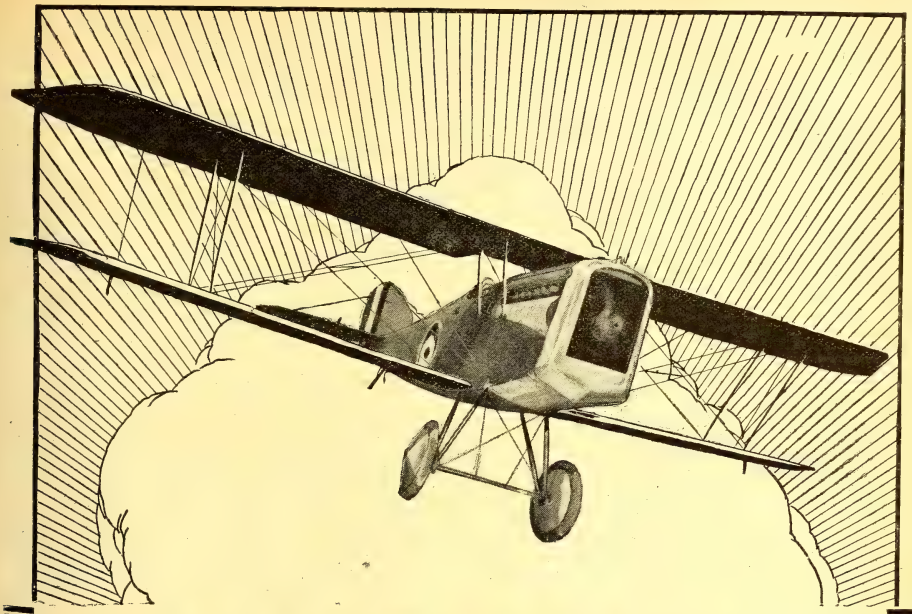
"An important business of the seaplane during the war was hunting submarines. As is well known, a submarine, when not too deeply submerged, is easily seen silhouetted against the sea bottom from a point of vantage a certain distance above the water. The same is true of the larger species of fish. A good-sized mullet, for instance, can be seen from an altitude of two or three hundred feet, when swimming over a sandy bottom."

One presumes that the American mullet is larger than ours, but one was not aware that its displacement is as great as that of a submarine, as this paragraph would lead one to believe. The last paragraph is, however, confusing, as it is not clear whether it is the mullet or the seaplane that is swimming over a sandy bottom at an altitude of two or three hundred feet.

To continue:—

"Professor Joubin proposes the establishment of a regular patrol by 'hydroplanes' over the various fishing grounds. These craft should be equipped with radio-telegraphic apparatus, whereby they would notify the fishermen of the neighbourhood whenever a shoal of fish was located. This plan would result in a great saving of the fishermen's time. It would also ensure a more economical use of expensive bait, such as the peanut flour and fish-roe, used in sardine fishing."

Not being expert in the art of sardine fishing, one hesitates to comment upon this paragraph, as it is not stated whether it is the pilot or the fisherman who feeds the sardines on peanut flour.



MARTINSYDE

DESIGNERS OF THE FAMOUS

F4 FIGHTER

WHICH ESTABLISHED THE

WAR RECORD

FOR CLIMB AND SPEED AT HEIGHT.

A ROLLS-MARTINSYDE

OF THIS TYPE HOLDS

THE LONDON-PARIS SPEED RECORD,

1 HOUR 15 MIN.

TRANS-ATLANTIC TYPE.

INQUIRIES INVITED FOR PASSENGER-OR MAIL-CARRYING MACHINES OF THIS TYPE.
SPECIFICATIONS WILL INCLUDE

ROLLS-ROYCE ENGINES,

"FALCON" 285 H.P., OR "EAGLE" 350 H.P.

APPROXIMATE PRICE £3,000.

MARTINSYDE, LTD.,
WOKING, ENGLAND.
Telephones—551, 552 and 553 Woking.

The WORLD of AERONAUTICS (continued)

The Lord Chancellor's Flight.

The Lord Chancellor and his son made a flight in an Avro aeroplane at Hamble, near Southampton, on April 25th. The machine was an Avro five-seater—one of the latest type. At the conclusion of the flight Lord Birkenhead expressed great delight with his experience. The newspaper account says:—"Captain Hammersley was in charge of the arrangements, and the machine was piloted by Mr. Chilcott." Captain Hammersley is a very expert pilot, but one was not aware that Mr. Chilcott, M.P. (late R.N.V.R., attd. R.N.A.S.), was a pilot.

That Flag.

The voyage of an airship from London to Windsor flying the new R.A.F. flag, raises rather an interesting point to which one ventures to draw the attention of the Air Ministry.

It appears that all airships are at present for purposes of administration and operations under the Admiralty. Being thus, in theory and practice, vessels of the Royal Navy, they are obliged when on duty to fly the White Ensign. The point, therefore, arises as to whether it is proper for any airship to fly the R.A.F. flag.

Perhaps the Air Ministry will be so good as to issue an order on the subject.

Recruiting Circuses.

The official "Air Service News Letter" from Washington is always interesting and often unintentionally funny. The one just received appears to indicate that the United States Air Service is in need of men, and therefore what is described as "a drive for recruits" has been organised. One prefers to make no attempt to translate the announcement into English.

"The Army Air Service launches its first recruiting campaign on April 9th, in connection with the three Victory Loan Flying Circuses operating chiefly for the Treasury Department. These flying expeditions were organised at Ellington Field, Texas; Hazelhurst Field, Long Island; and Rockwell Field, California, to tour adjacent sections. They comprise 12 or 15 American pilots each, including an American Ace who won distinction in the air overseas, and aces from the French and British Air Services who also distinguished themselves in their battles with the enemy. An Air Service recruiting officer is attached to each flight.

"Authority has just been received by the Director of Air Service to send out special recruiting expeditions in airplanes from 17 Air Service centres and 4 balloon fields in an effort to recruit men for the Air Service. Not only will flights be made over neighbouring cities, but demonstrations of assembling and taking down planes will be staged. In this drive for recruits the Air Service will co-operate with local general recruiting agencies."

One learns more of the Victory Loan Flying Circuses in another portion of the Official News Letter. For example:—

"Many schemes are to be used in the raising of the huge fifth Liberty Loan, but one of the most unique plans of all is the sending of three Flying Circuses over the country. The circus will carry two Fokkers, four Spads, five S.E.5's, and five Curtiss H's ships."

This is certainly one of "the most unique plans of all"; that is to say that even America cannot produce anything uniquer.

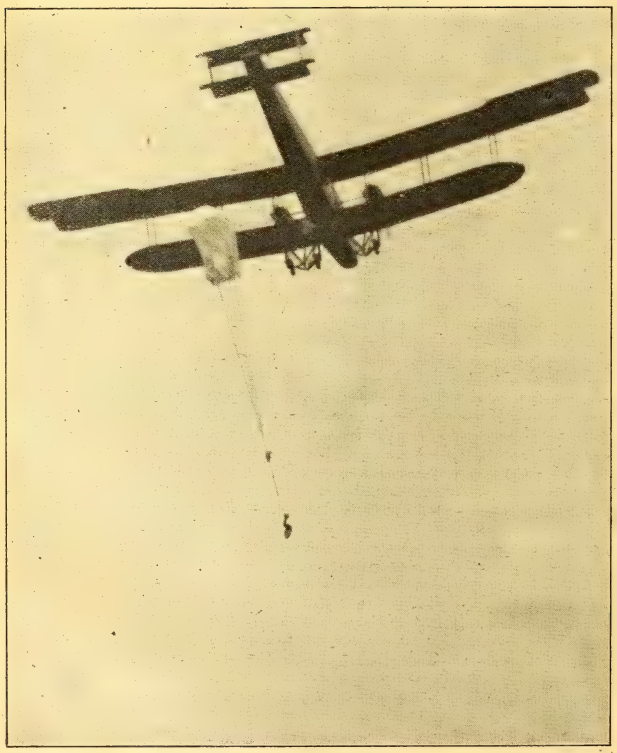
The Fatal Accident near Sleaford.

Flight Cadet Trevor Walter Chater, R.A.F., was charged at Sleaford with the manslaughter of Captain Robin Dunn and Lieut. Pegg, who were killed by an aeroplane on March 18th.

The accused, the pilot of the aeroplane, said that he was diving at a haystack near a road and did not see the trap in which the officers were driving. He was not aware that he had caught anything but felt a slight bump.

He admitted that he had a signed order not to dive near roads. A statement made by him to the adjutant was objected to as evidence by Mr. Mellor, who defended, on the ground that it was made to a superior officer.

The magistrate said there had been reckless disregard of orders, and committed the accused to the assizes, allowing bail on his own recognisances.



TO MAKE A HENDON HOLIDAY.—Miss Sylvia Boyden making a descent with a "Guardian Angel" Parachute from a Handley Page Machine (Rolls-Royce Engines). It will be noted that the modern parachutist dives head-first instead of descending feet first.

An Invalid.

Mr. A. Baldwin Raper, M.P., late Lieut. R.A.F., who has recently been asking some very pertinent questions in the House of Commons on the subject of aircraft, has been laid up recently owing to an operation for appendicitis. Some complications ensued immediately after the operation, but he is now making rapid progress and hopes soon to be back on duty.

65's Dinner.

It is proposed to hold a dinner in London on May 17th for all officers who served with this squadron in France. Will anyone wishing to attend please communicate with Capt. Withington, 12, Dover Street, enclosing £2 for expenses?

A Projected Polar Exploration.

Another expedition to the Antarctic regions is to be made under the leadership of Mr. John L. Cope, F.R.G.S., who accompanied the Imperial Trans-Atlantic Expedition, 1914-17, as surgeon and biologist to the Ross Sea party.

The expedition intends to leave this country in June, 1920, in the "Terra Nova," and to return in 1926. An aeroplane is to be taken for surveying purposes, and possibly for a flight to the South Pole. The temporary headquarters of the expedition are at 17, Somerset Street, London, W.1.

An Alleged Deception.

Captain Shelby Cullom Chapman, formerly of the United States Army, has been arrested in Chicago for, it is alleged, "posing as an air hero." It appears that when Capt. Chapman was going home, some reporters in New York confused him with a Lieut. Chapman, U.S.A., A.S., who was killed in action, but previously gained a certain amount of distinction, and Capt. Chapman, it is alleged, kept up the deception.


The finest all-round passenger and cargo machine yet constructed
Full particulars of the "Bristol" Triplane or other "Bristol" Aeroplanes will be forwarded on application to:
The Designers and Constructors,
THE BRITISH AND COLONIAL AEROPLANE CO., LTD.,
Filton, Bristol.
Telegrams: "Aviation, Filton." Telephone 3906.
"The Bristol" Aeroplanes

The WORLD of AERONAUTICS (continued)

An Exhibition for Leeds.

The Aircraft Exhibition at Newcastle has been visited by about 200,000 people during the six weeks that it has been open, and owing to its success it is to have another lease of life in Roundhay Park, Leeds. The exhibition includes a specimen of practically every type of British and German machine. Engines, machine-guns, cameras, wireless apparatus, etc., are shown, and there is an excellent collection of photographs. Kinema films are used to illustrate various aspects of modern flight.

A circus of skilful pilots has been employed to give exhibitions of flying in Avros, Snipes, and Camels, and there is one kite balloon in which the public have been allowed to make ascents at the rate of £1 1s. per head. To popularise these ascents, a scheme was devised which suggests that the inventor had some knowledge of human nature. The K.B. carried the usual telephone, and this was connected to the exchange, so that passengers while in the air might ring up their friends and advise them of their heroism. The opportunity to inform mere ground-lubbers that they were speaking from a height of, say, three thousand feet proved a great attraction to many. It must have given them the delightful sensation of talking down to the level of their inferiors.

Appointments for Demobilised Officers.

Though one is not concerned with the advertisements which conceal the editorial columns of this paper one could not help being struck the other day by the statement of a certain advertiser to the effect that his is the *only* concern which is devoted to the job of finding employment for demobilised R.A.F. officers. One would therefore like to draw the attention of the advertiser in question, as well as that of all readers of this paper, to the fact that the R.A.F. Department of the Appointments Branch, Ministry of Labour, St. Ermin's Hotel, S.W.1, is concerned solely and entirely with precisely such work and is not doing it for any fee or profit.

Employers of all sorts who want good men, from managing directors down to junior clerks, in any sort of business, are earnestly requested to communicate with Room 238, St. Ermin's Hotel, stating the particular kind of man they need. Officers in need of a job should also write to Room 238 saying what sort of job their experience fits them to fill—*after* they have previously communicated with their local Headquarters of the Appointments Branch. A number of ex-officers R.A.F. have already got decent jobs from that Department, and one is earnestly desirous of seeing both employers of labour and applicants for jobs give their heartiest support to this Department, which has been established solely for the benefit of demobilised officers.

The Late Jules Vedrines.

By the death of Jules Védrines another link is broken in the living chain that connects aviation of to-day with the days of early experiment. A child of the people, an Apache by instinct and by habit, he nevertheless made a great name for himself in the world of aeronautics by his perseverance and determination in a profession which, if not lacking in rewards, is certainly not free from danger and from bitter disillusion.



The Late Jules Védrines.

At one time, in the days before he had found anyone trusting enough to provide means for his education in aviation, he was employed as a mechanic by Mr. Robert Loraine, then acquiring merit as an aviator of singular enterprise.

Later he became an aviator and almost at once sprang into fame. Each of the great circuits and races in which France and Great Britain took an active part had Védrines as an entrant. Not always victorious, he rarely failed to attain some manner of distinction.

During the war he showed that he possessed the courage proper to soldiers.

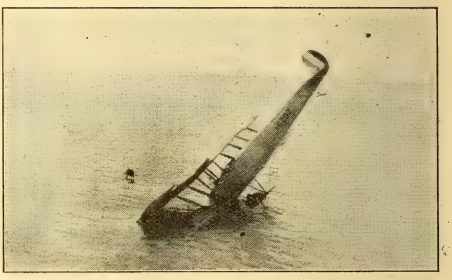
Disliked in life for entire lack of charm or courtesy, his death is regretted by all those who admire bravery in any path of life.

Low Flying.

The following letter has been received :—

Sir,—I read your leader of April 2nd, on "The Selection of Aviators," with great interest, and I heartily agree with you. I have had ample opportunity for observing the idiotic low-flying stunts that some chaps indulge in, and I must say that they don't tend to increase one's sense of security.

At a certain west-coast resort where I used to live, machines used to come from two aerodromes about 15 miles distant, and skim along the promenade with one wing literally almost touching the rail. I remember one case in particular. An Avro was



The finish of a low-flying performance.

flying low, when the engine failed and the pilot attempted to land on a bit of shingly beach, but bounced and landed in the water, as shown in the snapshot which I enclose.

Another case I remember is as follows : On a hill in the neighbourhood were two poplar trees, about twelve yards apart. An Avro, flying low, steered straight for these and flew in between, about six feet from the ground. Of course it was magnificent flying, but rather too dangerous for both the pilot and the spectators.

(Signed) G. Simpson.

The Royal Air Force Club.

In connection with the purchase of the Lyceum Club by Lord Cowdray for the Royal Air Force Club, it now appears that Lord Cowdray has also purchased extensive additional adjoining properties, including the famous Milton job yard and riding school, a block of residential flats, and a large range of stable premises. The total area of property acquired is 116,000 square feet.

Under these circumstances one hopes that there will be a "peace-time" Air Force sufficiently strong to make good use of the extensive premises.

Theft in the Royal Air Force.

Lieut. Arthur Charles Hankey, R.A.F., 29, of Gray's Inn Road, W.C., was charged at Feltham on April 23rd, with stealing from Hurst Park ten barrels containing 400 gallons of lubricating oil, value £70, the property of the Secretary for War, and Lieut. Charles Joseph Young, R.A.F., 39, of West Brompton, was charged at the same time with being concerned in the theft, and William James Twigg, 50, motor engineer, Hampton, was also charged with having in his possession 31 empty petrol tins, supposed to be stolen.

Detective Inspector Prothero gave evidence and the accused were remanded on bail.

The All-Metal Aeroplane.

Capt. A. P. Thurston, whose lecture on "The All-Metal Aeroplane" had unfortunately to be postponed some time ago, has now arranged to deliver the lecture on Wednesday, May 14th, at 8 p.m. The meeting will take place in the Hall of the Royal Society of Arts, John Street, Adelphi, which, as usual, has been kindly lent for the purpose to the Royal Aeronautical Society.

It is almost unnecessary to draw the attention of the readers of this paper to the importance of the subject of this lecture. Many attempts have been made from the earliest days of aviation to produce all-metal aeroplanes. All have been unsuccessful until comparatively recently, since steel construction of an entirely new type has been brought into being, largely through the efforts of the Steel Wing Company, the head of which is Mr. Mooney. Many of the machines which have been called all-metal machines have in fact only had steel-tube fuselages and occasionally have had steel-tube wing-spars, but hardly any, if any, have had the complete wing structure and fuselage structure made of metal.

Capt. Thurston has made a special study of the uses of various metals, and of various methods of using them, for some years past, and as one of the pioneers of aeronautical science his lecture should be of more than usual interest to aeroplane constructors and users.

Tickets for the lecture can be obtained free from Mr. W. Barnard Faraday, Secretary, The Royal Aeronautical Society of Great Britain, 7, Albemarle Street, W.1.

ROLLS-ROYCE



The Future of Flying depends on Trustworthiness.

LONDON to PARIS in 75 mins.

NEW FLIGHT RECORD

A MARTINSYDE plane with ROLLS-ROYCE ENGINE left Hendon Aerodrome, London, at 3.20 p.m. on April 8th last and travelling via Dieppe landed at Buc Aerodrome, Paris, a distance of 215 miles, 75 minutes after its departure from London. This gives an average speed of

172 MILES AN HOUR or over 2¾ MILES A MINUTE

The following Aircraft entered in Great Britain for Atlantic Flight are fitted with ROLLS-ROYCE engines.

WHITEHEAD - -	with ROLLS-ROYCE engines
SOPWITH - -	with ROLLS-ROYCE engine
SHORT - - -	with ROLLS-ROYCE engine
FAIREY - - -	with ROLLS-ROYCE engine
MARTINSYDE - -	with ROLLS-ROYCE engine
HANDLEY PAGE -	with ROLLS-ROYCE engines

Also the great PORTE FLYING BOAT fitted with 5 ROLLS-ROYCE engines will attempt to fly the Atlantic.

ROLLS-ROYCE Aero Engines like ROLLS-ROYCE CARS ARE THE BEST IN THE WORLD.

ROLLS-ROYCE LIMITED, 15, Conduit St., London, W 1.

ROLLS-ROYCE

PARIS NOTES

Paris, April 28th.

A New Directeur.

According to a decree of April 15th, Colonel Dhé has been replaced in the office of Directeur de l'Aeronautique Militaire by Brigadier-General Duval.

Colonel Dhé has held office since November, 1917, when the Aeronautical Services were to be separated in two parts, one to be under the War Minister and the other under the French equivalent of our Minister of Munitions. Colonel Dhe assumed control of the two and combined the functions of both heads in himself. Thanks to his technical knowledge and his capacity for work and organisation he was able to maintain the cohesion of the whole, which enabled the French to make in 1918 their most formidable aeronautical effort since the Battles of Verdun and the Somme in 1916, notwithstanding the fact that, during a large part of the German offensive most of the Parisian factories were required to be able to remove machinery, materiel, and personnel at a few days' notice.

On him devolved the responsibility of creating the Department and organisation of Civil Aviation, but he did not receive the support from his superiors that he had a right to expect. Lately, he had presided, at the request of the delegates of the Allied Aeronautical Commission, over their deliberations, a work which has now come to an end. Considering his duty finished he asked to be released immediately in order to undertake certain civilian work, where no doubt he will continue to display his talents unfettered by routine and jealousy.

Another Aviation Company.

One of the most promising signs of the times is a new company lately registered under the title of Compagnie des Messageries Aériennes, with a very large capital. They intend to promote the development of Aviation in all its forms in France or its colonies, and later on abroad, by the organisation of aerial transport of postal packages, letters, merchandise and passengers.

The offices of the concern are 55-57, Avenue Kléber, Paris, and its first administrators are Messrs. Louis Bréguet, Louis Blériot, Réné Caudron and the Morane-Saulnier Company. This is the organisation to which I referred two months ago as being in course of formation.

An Ambitious Attempt.

Lieut. Fontan, who hopes to fly from Paris-Casablanca-Dakar and then, if all goes well, to South America, is in no wise deterred by the untimely end of his friend Védrines, and is making the most elaborate preparations for an early start.

Post-Bellum Plans.

All the big aeroplane factories here are busy putting their houses in order. Messrs Lioré et Olivier have an hydravion under consideration as well as their ordinary machines, and are taking up shortly the manufacture of agricultural tractors.

Messrs. Blériot who had begun to make furniture in order to avoid a stoppage have received a big order from the State for motor fishing boats; they are also undertaking the manufacture of motor-cycles as well as a new type of aeroplane with four motors.

The big model buildings of Farman Frères at Billancourt show how an aeroplane factory should be laid out. All three brothers fly regularly, and M. Dick Farman daily. During the whole period of the war they have not had an accident to either pilot or machines in their reception tests or subsequent delivery to the Army, and they supplied well over 5,000!

Naval Aeronautics.

From a statement issued by the French Authorities one notes that on October 1st, 1918, the French Navy possessed 870 avions or hydravions, 59 airships, and 198 observations balloons divided up as follows:—

Sector.	Avions or Hydravions.	Dirig.	Balloons.
Dunkirk-Cherbourg	168	21	22
Brittany	104	11	39
Loire-Bidassoa	74	7	21
Mediterranean (French coast)	110	4	41
Corsica	38	2	0
Portugal	16	0	0
Algeria-Tunis	176	11	31
Morocco-Senegal	44	0	0
Corfu	54	3	12
Ægean Sea	86	0	32
	870	59	198

From Bordeaux comes news of a new giant hydravion built to carry 18 passengers. A single motor of 500 h.p. with 18 cylinders is the motive power. Its trial flight was successful.

At the signing of the Armistice four firms were turning out hydravions for the "high seas" in large quantities. The G. Levy at St. Raphael, the Tellier-Nieuport and the Latham on the Seine, and the Donnet at Lorient.

The following details are available:—

Weight, fully loaded, seven tons.
Span, 30 metres.
Nacelle, length, 18-20 metres.
Overall, height, 5.50 mm.
H.P., 1,050; h.p. in three motors of 350 h.p. each.

All being of the central hull type. At the moment new types of 2,000 to 3,000 h.p. are being studied with a view to commercial usage.

Naval Lieut. Lefranc, piloting an old type hydravion, has just completed a trip in Senegal of 650 kilometres in nine hours.

MM. Nungesser and Navarre, two notable war aces, are giving up aviation in favour of motor racing.

A Proposed Aerial Circus.

There is a proposition on foot to organise an aerial circus to tour France and abroad, and to be composed of three men and three women. Colour is lent to this rumour by the activity of Mlle. Jane Hervieu and Mdme. de Laroche, who is re-learning to fly on a G3 Caudron. Mlle. Hervieu has taken up several passengers lately, is now learning how to loop the loop, and during the holidays flew over Paris, throwing out tracts on behalf of a war society.

A Flying Motor-cycle.

From Geneva comes news of a new motor-driven aviette, the invention of M. Duplan. It is designed to be used as an ordinary motor-cycle, but can deploy its wings in a few seconds. It weighs 230 kilos. and a 35 h.p. motor actuates either the propeller or the wheels.

Safety and Comfort.

The provisional list of stages in the preliminary trials in connection with the safety and comfort competition for which the "Echo de Paris" is offering £12,000 is now available. Starting from Paris, stops will be made at the following towns in France and neighbouring countries:—Nantes, Bordeaux, Toulouse, Barcelona, Nimes, Turin, Avignon, Geneva, Strasbourg, Brussels, London, and so back to Paris. Brief halts will be made at other places between these points.

Commercial and Postal Services.

The first trial of a civilian commercial aeroplane service between Paris and Lille was successful. On the 19th inst. a Bréguet biplane, piloted by Tessel, left Villacoublay at midday, with commercial mail and packages. He landed at Lille at 1.35. He left Lille again at 4 p.m. with the Military mail, which had been held up, landed at Le Bourget to deliver the Military mail, and at 5.30 arrived at Villacoublay with the civilian mail.

On the other hand, one regrets to record that a machine working the postal service between Paris and Strasbourg came to grief at St. Didier. The pilot and two passengers were killed or injured, and the mail destroyed.

The Farman Goliath made its weekly trip both ways with 15 passengers each journey. The return flight was made in 2¼ hours. On Easter Sunday, M. Dick Farman and his son, went for a flying trip to the Normandy coast and flew over Deauville, Cabourg, and Dieppe, returning to Toussus-le-Noble Monday morning.

The Avignon-Nice aerial postal service continues to operate.

Nimes has been classified as an aerogare, and from the 18th inst. an aerial postal service operates between it and Nice. 10,000 letters and two passengers will, it is expected, be carried per machine.

Good Performances.

Cross-country long-distance flights by French aviators between France and Spain are becoming too frequent to be mentioned individually. One fine performance is that of M. Royeres and two passengers who flew from Toulouse-Barcelona-Saragosse-Madrid.

Last week Capt. Roig, accompanied by Adj. Champs, flew in stages the circuit Paris-Lyon-Nimes-Toulous-Tarbes-Bordeaux-Poitiers-Paris on a 280 h.p. Salmson machine.

The Tour de France Aerien.

The Tour de France Aerien which is to start on Aug. 24th is to be open to airships as well as aeroplanes under certain conditions yet to be decided. Machines entered must carry at least one passenger, in addition to the pilot, and attain a height of 9,000 ft. in a minimum time. Only French or Allied firms are to be allowed to enter.

Switzerland.

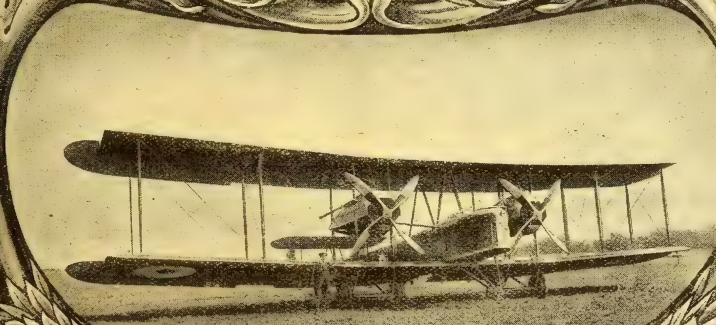
An aerial postal service is to be organised this summer between St. Gall and Geneva passing by Zurich, Berne and Lausanne. A tax of 50 c. per letter will be imposed. The service will only be temporary; experience having shown that good results are obtained even when the distance is over 600 kms.—F. T. N.

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BRAINS v. SUPERFICIAL SMARTNESS.

By "THE SNIPE."

As one who has been through the mill, may I be permitted to make a few comments on the smartness of the R.A.F. and its progenitors the R.F.C. and the R.N.A.S.?

The proposition is made for about the ten thousandth time that the efficiency of a Station may be judged by the smartness of the Airmen on Parade and the mechanical precision of their salutes.

I deny this flatly.

If ever I saw an Airman who was abnormally smart, whose tunic was always clean and creaseless, and whose every movement was made with a click, an Airman who was the pride of a Guardee Serjt.-Major, I usually found that as a mechanic he was a wash-out.

Such a man may, and does usually, "swing the lead" to any extent; he will never be checked. By the Serjt.-Major, and very probably by the Adjutant, he will be held up as a model to other Airmen who are merely good at their trades and who have been posted to the R.A.F. because of their proficiency as engine-fitters, turners, blacksmiths, or any other useful trades.

During the war the best of these tradesmen were frankly bored by the military discipline, which they regarded as eye-wash. First-class fitters who could be relied upon to put up the revs. of any engine that was running badly could rarely be made to understand why they should spend useful working hours at infantry drill.

At their own work they were enthusiasts; their hearts were in their jobs. While employed at their trades they felt the self-respect that is born of the knowledge that work is well done. There was no grousing over long hours. But there were heart-felt grumbles over purely military tasks that to them appeared mere waste of time.

I remember very vividly a certain station which had been originally the aerodrome of a large aeroplane manufacturing concern. A small number of civilians tuned, and tested the machines. Then the station was taken over by the R.F.C., and for months the chief topics of conversation consisted of comparisons between the civilian and military methods.

It was computed that under military organisation about 160 men were required to do the work formerly done by about 25 skilled workers, who were unhampered by military duties.

This station was commanded by an officer of a very famous infantry regiment. He had been attached to the R.F.C. after having been wounded in 1914.

He groused about having to command a rabble of "garage hands" and "ironmongers' assistants," and told the Adjutant to "give them hell in penny numbers." The Adjutant was a pilot who had seen some service in France, and, having succeeded in obtaining a ground job, was determined to keep it. He gave "hell in penny numbers" with a twopenny edition on Sundays.

A notorious Serjt.-Major was obtained to assist in keeping the station incandescent. This person invariably addressed the airmen as "You b—— rabble."

"What the Hell is that funny shaped man in the rear rank doing?" he would shout passionately, pointing to an expert engine-tuner, whose physical deformities had caused him to be rejected for service until sheer persistence had won him a job in which he could serve his country.

The Serjt.-Major would call that "funny shaped man" out from the ranks, inspect him with insolent contempt and then turn his back on him with the remark:—"Thank God, we've got a Navy!"

That was his stock irony. Except for this alleged jest, his weapon was invective.

Some of the officers complained of his language to the O.C. and were told that the station was not intended as a school for young ladies. So the hell in penny numbers became an interminable serial.

There were many well-qualified pilots and highly specialised technical officers there. The Infantry Officer Commanding the station decided that they were not smart enough, so he gave them a lecture lasting for one hour every morning and instructed the Adjutant to drill them for one hour and a half every afternoon.

Meanwhile, there was an immense amount of work to be done on the station. If the technical officers complained that they were unable to keep pace with it they were told that officers ought not to have to work; the routine should be carried on by the serjeants, and officers ought only to think of inculcating discipline.

A working day was by this time a farce. From 6 a.m. to 7 a.m. the men were drilled. At 9 a.m. there was the first working parade at which many airmen were detailed for fatigues. The remainder proceeded to the rigging, engine, armoury sheds, etc.

Their technical Officers would be with them for perhaps half an hour before they went to listen to the C.O.'s lecture on Military Law, Army Tradition, or some subject as far as possible removed from the kind of work upon which they were employed. When the lecture was over the men of their flights would have downed tools for the mid-morning "break."

The engine officer would look at the machines waiting attention, curse, and wonder how many he could have dealt with if he had been working with undisciplined civilians under a business manager-in-chief.

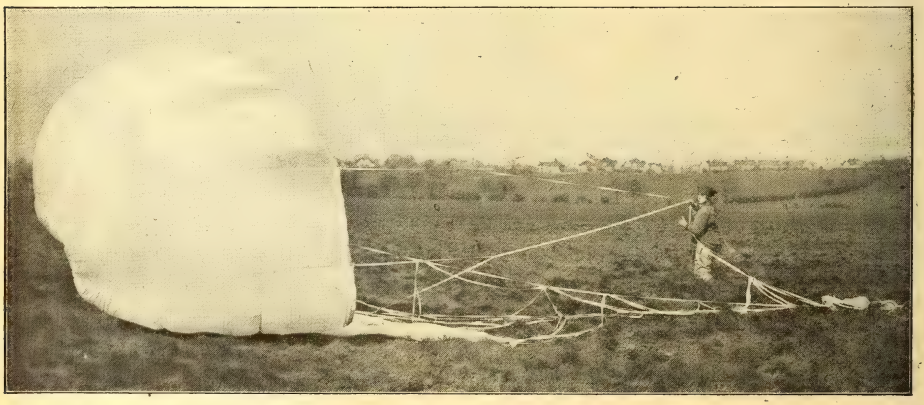
When the men returned he would find that his two best fitters had been placed under arrest for some trivial crime, and before his annoyance over the discovery had cooled down, a fire-alarm would sound and all hands would drop tools again, and double to their appointed stations.

These frequent fire drills were the Adjutant's hobby, and the busiest mornings were usually chosen. By the time a large number of Minimax Extinguishers had spouted their contents into the air, and had once—to the joy of the men—accidentally sprinkled the O.C., dinner-time would have arrived.

From 3 p.m. till tea-time the pilots and technical officers would be taking lessons in drill from the Adjutant, and if no other means of keeping the men from useful work could be devised, there would be a bathing parade, and they would be marched to an adjacent river.

At the end of the day most of the work for which this station was founded had been left undone, and everybody was considerably over-nourished with the absurd attempt to convert a lot of satisfactory mechanics into unsatisfactory soldiers. Had they been fit for infantry the majority of the men would not have been in the Force.

There is no exaggeration in this account. Thousands of offi-



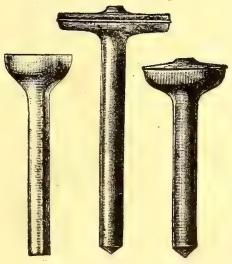
A GOOD LANDING.—Miss Sylvia Boyden photographed after a descent from a Handley Page Machine (Rolls-Royce Engines) with a Calthrop Parachute.

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cers found that the attempt to obtain a high degree of smartness led to inefficiency in other directions.

In many cases Commanding Officers have known nothing of the technical work of their stations, but they have felt compelled to make their influence felt, and, in consequence, have been "all out" for discipline.

Too often, also, we have had the wrong type of Adjutant. A pilot, aged about 22 years, who has lost his nerve for flying, is not the ideal officer for the position. He usually carries little weight with other pilots, and is only made an Adjutant because he has no special knowledge to enable him to qualify for the technical branches. Possibly he is nervously anxious to do well. Having no natural dignity nor influence with men he thinks he is bound to assume a hectoring attitude and is soon cordially disliked by everybody.

I have seen so many capable officers hindered in their work by the interference of boy Adjutants, that I know it would have been far better for the country to have pensioned the boys off as soon as they became unfit for flying than to allow them to play at soldiers with skilled officers and mechanics of twice their age.

The peace-time R.A.F. will, we hope, have learned its lessons. The one it should take most to heart is that it is a highly technical organisation. We want the most accomplished aviators in it and the most highly trained scientific minds of the country.

We do not want at the head administrative officers who rate the ability to salute smartly more highly than efficiency in other directions. We have seen too much of them in the past.

In peace-time it may be possible to introduce a reasonable amount of drilling into the training without unduly reducing the efficiency of the Force. But I contend that in war-time when there was practical work for every officer and man, the effort to produce the "smartness of the Guards" into a technical organisation was a mistake.

There was eternal conflict between those officers and airmen who earnestly wished to get on with the war by doing the work for which they had special knowledge, and those whose only chance of gaining distinction lay in drilling the men until they gained the approbation of be-ribboned disciplinarian inspecting officers upon whose reports the promotion of Commanding Officers of Units depended to a great extent.

If we insist on "the smartness of the Guards" we must inevitably lose the services of some of the most expert engine-tuners, electricians and other special ratings. Brains and acquired skill in technical work and excessive military smartness are rarely found in the same person. Bright, original minds, the ones we require in all branches of work connected with aviation are dulled by the effort to turn their owners into military machines. Every student of psychology knows that fine brains are the least susceptible to that form of discipline that tends to cramp them into conformity with those of the herd.

I knew one airman, a Britisher by birth, who, at the outbreak of war, was in America. He was a man of about 40 years of age, and was of poor physique. He paid his own passage to England and endeavoured to enlist, but was refused many times. Finally, he was placed in a low category and drafted into the R.F.C.

By trade he was a machinist, and he had that type of mind which has a natural fondness for science and mechanics. He showed ability for acquiring knowledge that almost amounted to genius, and, in a very short time, was familiar with every detail of eight or nine aero-engines and half a dozen aeroplanes.

He spent considerably more than his pay on technical handbooks dealing with aero-dynamics, wireless, photography and the many fascinatingly interesting subjects allied to aeronautics. This man was of the same breed as the pioneers of aviation, a man of natural talent and equally natural enthusiasm.

One day he was absent, and his serjeant explained that he was ill. Inquiry showed that he had fainted during a particularly severe drill.

His officer visited him in his tent and found him lying down reading one of his beloved technical works. Having a genuine respect for the man, he spoke about him to the Commanding Officer, and asked that he might be excused further drills, for which he was obviously unfitted. The C.O., however, had been inculcated with "the smartness of the Guards" principle. He suggested that the man was probably swinging the lead. He did not believe in 3rd A.M.'s who read "a lot of d——d theoretical rot" in order to escape drilling. Unless the M.O. certified that the man was permanently unfit for anything but light duty, he would take no action.

The result was that the man fainted again while drilling, though he made a plucky effort to "stick it," and when at last the M.O. was compelled to certify him unfit, the O.C., who believed in smartness before brains, had him drafted to another station.

So ended the career of one of the most promising A.M.'s that particular unit ever had. It is to be hoped for the sake of the Force that he served later under an officer who believed that in technical work brains are worth more than smartness.

I have not drawn upon imagination in these notes, but have spoken from practical experience. I could go further and say that the best fighting pilots and the best technical officers (who could generally be found in shabby, oil-soaked tunics during their working hours) were not the ones who on parade looked like the advertisements of military tailors, or were specially noted for their love of soldierly smartness.

The war was not won by saluting in the face of the enemy, but by officers and airmen who did specialised work in which they were, I think, handicapped more than helped by the purely military element.

In the peace establishment of the R.A.F. we should be guided by past experience. We have no need to take the Guards as our model for smartness or the Navy for handiness. Let us have our own sulphur and our own matches and make our own Hell. It will be an improvement upon that in which we suffered in the past.

THE ROYAL AERO CLUB.

FLYING SERVICES FUND COMMITTEE.

A meeting of the Flying Services Fund Committee was held on Monday, the 14th inst., when there were present Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F., in the chair; Mr. Chester Fox; and Mr. Harold E. Perrin, secretary.

CHAIRMAN.—On the motion of Lieut.-Col T. O'B. Hubbard, seconded by Mr. Chester Fox, Brig.-Gen. R. H. More, C.M.G., was elected chairman for the current year.

GRANTS AND ALLOWANCES.—The following grants and allowances were made:—

(28) A grant of £5 to an ex-A.M.I. in the Royal Naval Air Service who had been incapacitated on active service.

(99) A continued allowance of £2 a month for six months to the mother of a Sergeant in the Royal Air Force who had died on active service.

(112) A continued allowance of £2 a month for six months to the widow of a 1st Class Air Mechanic in the Royal Air Service who had been killed on active service.

(150) The school fees of two children of the widow of a Private in the Royal Air Force who had been killed on active service.

(167) A grant of £10 to the widow of a Captain in the Royal Air Force who had died on active service.

(168) An allowance of £2 a month for six months to the mother of a Private in the Royal Air Force who had died on active service.

(169) An allowance of £2 a month for six months to the widow of a Private in the Royal Flying Corps who had died on active service.

(172) An allowance of £2 a month for six months to the widow of a Private in the Royal Air Force who had been killed on active service.

(173) An allowance of £2 a month for six months to the widow of a 3rd Class Air Mechanic in the Royal Air Force who had died on active service.

(174) An allowance of £2 a month for six months to the widow of a Private in the Royal Air Force who had died on active service.

(175) An allowance of £1 a month for six months to the widow of a 2nd Class Air Mechanic in the Royal Air Force who had died on active service.

(177) An allowance of £2 a month for six months to the widow of a 3rd Class Air Mechanic in the Royal Air Force who had been killed on active service.

(182) An allowance of £2 a month for six months to the widow of a Corporal in the Royal Air Force who had been killed on active service.

(183) An allowance of £1 a month for six months to the mother of a 3rd Class Air Mechanic in the Royal Flying Corps who had died on active service.

(184) An allowance of £2 a month for six months to the widow of a 2nd Class Air Mechanic in the Royal Flying Corps who had died on active service.

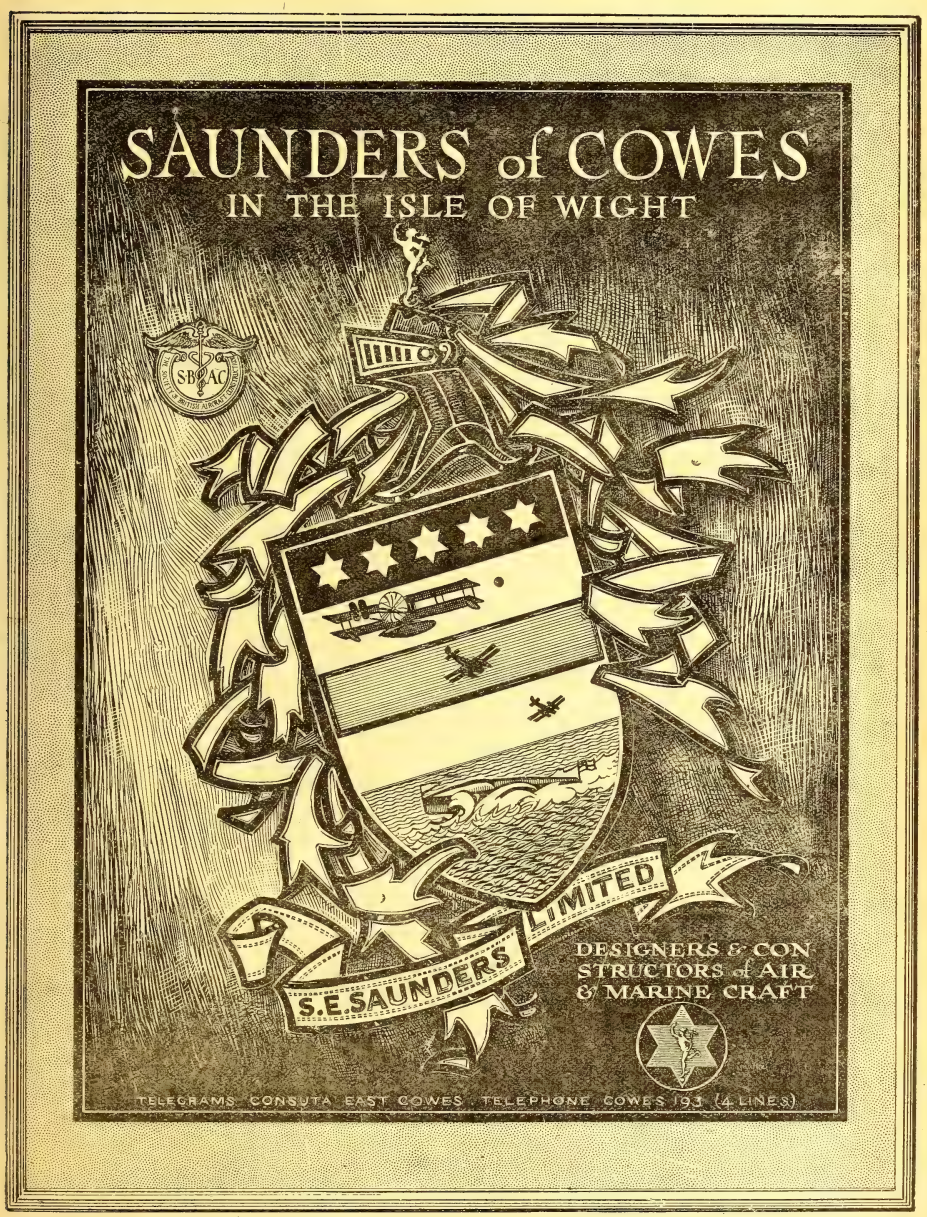
Total subscriptions received to April 8th, 1919 ...	£14,941	1	1
Collections made at Church of England Parade Services in the South-Western Area, Headquarters, Royal Air Force, Salisbury	24	0	0
Collections made at Church Services held at No. 143 Squadron, Royal Air Force, Detling ...	1	0	0
Total, April 22nd, 1919	£14,966	1	1

AN AMERICAN VISIT.

It is stated that a number of American officers are to visit Holland in order to investigate some new developments in the Fokker type of aircraft.

THE TRIAL OF AN AMERICAN AVIATOR.

The Naval court martial upon Capt. Edmund Chamberlain, U.S.A. Air Service, was continued in Paris on April 22nd, when evidence for the defence was heard.


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THE DAILY PRESS AND CIVIL AVIATION.

A Warning To Those Concerned for the Progress of Aeronautics.

The attitude of the daily Press in relation to the unfortunate accident to the Handley Page biplane at Wey Hill, near Andover, should be a warning to those who imagine that the daily papers are going to be any real assistance to the progress of Civil Aviation. The daily papers are out for sensation, or for what the limited intelligence of the majority of their editors calls "a good story." Hardly any, if any, of them are seriously interested in the welfare of aeronautics as such, therefore those concerned with Civil Aviation will do well to realise that the future of Civil Aviation depends on themselves and not on the help which they will receive from the Press.

An officer of the R.F.C. summed up the situation excellently a few days ago when he remarked that "the one thing which would eclipse the trans-Atlantic flight in the daily Press, if both happened simultaneously, would be a smash with a four-engined machine containing a Bank Holiday crowd of about 50 people complete with oranges and bananas." One feels fairly sure that such an accident would appeal to the daily Press as a far better "air story" than would the mere successful crossing of the Atlantic.

It would give every hack writer in the purlieus of Fleet Street the opportunity of a lifetime to indulge in purple passages into which he could work all the pet journalistic clichés about "flying tragedies," "dramatic incidents," "distressing scenes," "blood-curdling screams," "charred corpses," "blazing planes," "survivors' jumps," "army airmen killed" (despite the fact that the pilot might be a very distinguished R.N.A.S. officer transformed into an R.A.F. officer), and all the rest of it. It would be so much easier to write up such an event at so many pence a line than it would be to find anything exciting to say about a perfectly peaceful Atlantic crossing.

The Benefits of Dora.

The unfortunate D.O.R.A. has been much abused, and deservedly so, but she had certain virtues. The greatest of these perhaps was that she prevented the daily Press from injuring aviation with its assinine attentions. Somehow or another the progress of aviation, until D.O.R.A. intervened, resembled the steady plodding progress of a caravan through the desert with a herd of wild asses prancing and braying alongside. And it seems that now that D.O.R.A. is in extremis, the wild asses can return to the charge.

As a matter of fact, the Wey Hill accident, regrettable though it was, differed very little from a number of other accidents which have occurred during the war. At least one twin-engine machine caught fire in the air at the Manston aerodrome and burnt four or five people to death. It is common knowledge that the first of all the four-engined Handley Pages, owing to some curious and uncertain cause, got into a spin at Golders Green, hit the ground nose on, and burnt four of its crew to death. It fell on a man working in an allotment garden and burnt him to death. The two occupants of the gunner's cockpit in the tail were thrown out, one of them—the manager of the Aviation Department at Harland and Wolff's Works in Belfast—was killed on the spot, and the other, Lieut.-Col. Alec Ogilvie, escaped with a broken arm and concussion (he was the sole survivor). Among the other four occupants was Mr. Bertram Cooper, formerly Secretary of the Aeronautical Society. Thanks to D.O.R.A. the daily Press was compelled to leave such an excellent story alone, but one can imagine the columns which would have been expended on that accident if it had happened in peace time.

Incidentally in this connection it is interesting to note that Herr Hans Vollmöller, one of the earliest of German pilots and a particularly charming young man, was killed in an accident to either the first or one of the first of the four-engined German "Albatros" machines.

Accidental Causes.

The inquest on the crew of the machine which was crashed at Wey Hill leaves one undecided as to whether the accident was the fault of the pilot or of the machine. One officer is said to have stated that Major Batchelor seemed to be too careful and that in attempting not to climb the machine too steeply he hit the shed in the dark. On the other hand, Flight-Serjeant H. W. Smith, who was one of the two survivors, expressed his opinion that the machine swerved to the right, did not appear to climb, and seemed to be sluggish.

Considering that the machine was not carrying anything like her full load, it would seem that there must have been something wrong with this particular machine if she failed to rise and behaved sluggishly. It is further of interest to note that the machine was described at the inquest as being very nearly new. It would be interesting to know precisely what is meant by this description.

A Straight Question.

For example, a machine which had been standing in the wet at Hendon for two months but had not been flown might have been delivered thence to Wey Hill during the recent spell of fairly fine weather and so would be nearly new, so far as Wey Hill was concerned. At the same time it might have suffered very considerably from its exposure and might have become so warped or so deteriorated internally as to account for that unexplained swerve to the right and the sluggish climb afterwards.

The Air Ministry would therefore do well to let it be known publicly whether this particular machine was one of the Handley Pages recently taken away from Hendon after having been exposed to the weather, or whether it was in fact a practically new machine direct from the firm's works. A number of people in the R.A.F. would no doubt be interested to know the answer to this question.

A Skilful Pilot.

It scarcely seems likely that Major Batchelor, the pilot, made a mistake, for he was quite one of the most experienced night flying pilots in the King's Service, and, as was stated at the inquest, he was extraordinarily careful. It is related of him that when he was preparing for the big attack on the lock gates at Zeebrugge he had a full-scale plan of the locks and the surrounding buildings marked out on the ground for him at an aerodrome in the North, and used to practise dropping bombs by day and by night and in all sorts of weather on this plan until he was absolutely sure of hitting his mark under all conditions. The result was that when the attack actually came off it was an entire success.

All know that he was a very gallant officer, as was proved by the fact that in the same attack he flew so low in order to make sure of his mark that he and every member of his crew were wounded, he himself having to bring the machine back to Dunkirk with one hand. Few decorations have been better earned than those won by Major Batchelor, and his death is a very great loss to the King's Service.

A Necessary Warning.

Despite all this the accident was not of such magnitude as to justify the attention which has been given to it by the daily Press, and therefore one repeats the warning with which these notes began, namely, that those concerned with the progress of aviation must realise that the future of aviation depends on themselves and not on newspaper booming, because the daily Press will undoubtedly do at least as much harm to the progress of aviation as it will do good.

The only way in which the Press can be prevented from doing harm to aviation is by depriving the Press of opportunities for attacking aviation. Accidents must be avoided, and the only way in which accidents can be avoided is by selecting pilots with the very greatest of care and by paying the strictest attention to the state in which machines are allowed to fly. Not only must accidents be avoided, but all causes of offence to the general public must equally be avoided.

Fool Flying.

Civilian pilots must be prevented from playing tricks over crowds at aerodromes or elsewhere. Pilots must also be strictly prohibited from flying low over inhabited areas or over such places as promenades and beaches at holiday resorts. Such performances as charging at groups of people on aerodromes, or diving at vehicles on roads or at vessels on the sea, or rivers, or on lakes, must also be strictly forbidden.

R.A.F. pilots have been warned against such behaviour in the past, but apparently absolutely without effect, thanks to lack of discipline in the R.A.F. It remains to be seen whether the Society of British Aircraft Constructors, as representing the employers of civilian aviators, and the Royal Aero Club as the governing body of the sport of flying, will exercise stricter control over civilian aviators than did the R.A.F. authorities over Service aviators.

It will take very little caddish behaviour on the part of aviators to produce in the sensational Press an outcry against "air hogs" similar to that outcry against "road hogs" which made all motorists so unpopular a few years before the war.

The Good Name of Aviation.

It is to be hoped that the Controller-General of Civil Aviation will back up the Society of British Aircraft Constructors and the Royal Aero Club by inflicting severe punishment upon Civil Service aviators employed under his Department who may misconduct themselves in the air. But ultimately the good name of aviation depends on the firmness of the Society of British Aircraft Constructors and the Aero Club. One has no fear of misbehaviour on the part of pilots employed by large and respectable aerial transport firms, but one has grave doubts about what may be done by pilots who are their own masters, and by cheap and inexperienced pilots employed by cheap get-rich-quick firms who are out to make money from what are vulgarly termed "joy-ride stunts."

If Civil Aviation gets a bad name through accidents caused by caddish flying, or by badly-built or ill-attended machines, the Aircraft Industry will have nobody but itself to blame, and it will certainly not be able to plead in such an event that it has not had fair warning.—C. G. G.

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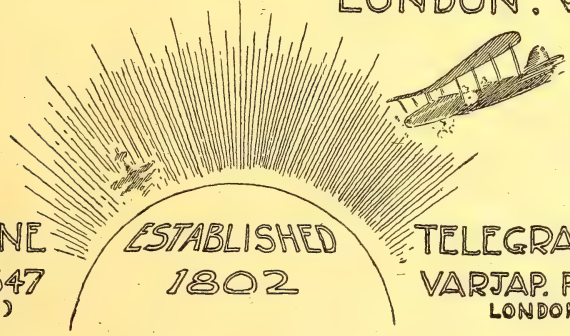
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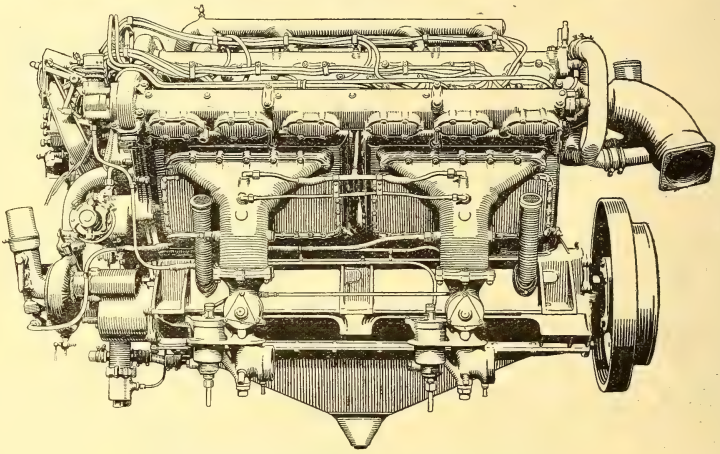


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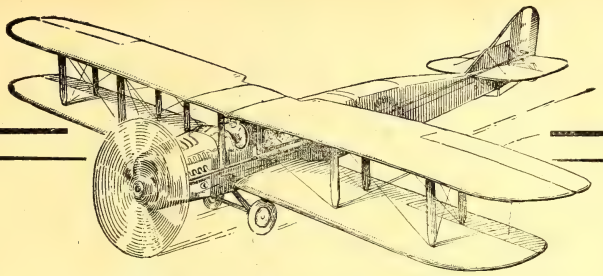
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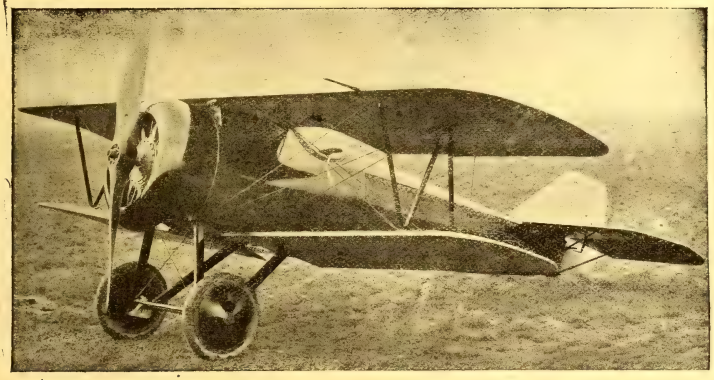
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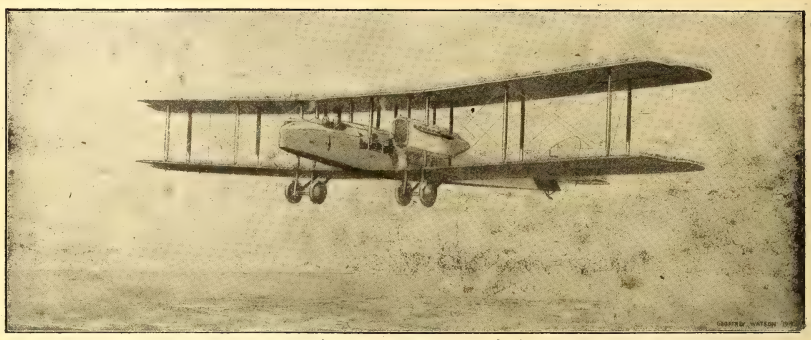
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THE WEEKLY COMMENTARY.

Discussing the design of a twin-engined high-speed passenger-carrier for the same duties as the single-engined machine considered in the last instalment of his articles, Capt. Sayers concludes that for this particular case the use of the twin-engined machine is not warranted except on the score of reliability.

With regard to this point Capt. Sayers suggests that the superiority of two-engined machines has been considerably exaggerated, and that the single-engined machine may soon come to be regarded as the more reliable type.

The description of machines designed and built by Messrs. A. V. Roe & Co., Ltd., is continued in this week's instalment of the series on "Modern British Aeroplanes."

COMMERCIAL AIRCRAFT DESIGN.—XI.

HIGH-SPEED PASSENGER-CARRIERS.

By Capt. W. H. Sayers, late R.A.F.

Consider now the case of a twin-engined machine, to the same general specification as that outlined in the last instalment.

The requirements are that 1,200 lbs. of load, in the form of six passengers and luggage, together with the crew and four hours' fuel, shall be carried at a maximum speed of at least 120 miles per hour, and that, with full load, the landing speed shall not exceed 45 m.p.h.

It will not be possible to produce the required result by cutting off the fuselage of the machine shown in Fig. 15 ahead of the passengers' cabin, and placing two 300 h.p. power plants on the wings, even if by setting these wings farther aft on the fuselage the machine could be brought into balance fore and aft.

In the first place, the one and a half wing arrangement with the lower wing staggered back makes it difficult to design a satisfactory engine mounting, particularly if tractor airscrews are to be used, because the power plant must overhang the lower wing considerably if the airscrew is to clear the upper plane.

It is usually desirable that the engines should be as far forward as possible in order to balance the machine, and any pronounced stagger adds to the difficulty.

Secondly, to give clearance for airscrews of reasonable diameter, engine centres must be at least 13 ft. apart. The machine shown in Fig. 16 has a span of only 55 ft., and with two large engines spaced so far apart it would probably become unmanageable laterally.

Thirdly, two large nacelles in the small gap of 6 ft. would interfere very considerably with the air flow through the gap.

With so small a total surface this would lead to a very noticeable loss of lift and an increase in the resistance. This would put the landing speed up very considerably, and would pull down the top speed to some extent.

These three factors all call for an increase of the span for a reduced stagger and an increased gap.

On a span of 70 ft. the twin-engined machine would become fairly reasonably proportioned, and would be controllable sideways, but on that span the weight would inevitably increase, even allowing for the effect of distributing the loads upon the weight of the wing structure.

If it were assumed that the total weight remained at 7,200 lbs, and if the total surface and loading were kept as in Fig. 16, then with equal top and bottom chords on 70 ft. span the wing chord would be about 5 ft. It would be impossible to use wing spars even as deep as those in the lower wing of Fig. 16. Shallow spars are necessarily heavy, and the total wing weight would increase on this account.

It will therefore probably pay to increase the total surface fairly considerably, reduce the loading per square foot, and use a wing with a good lift/drag ratio which will enable the required top speed to be reached even with a fairly high load per h.p.

Using any of the standard types of high-speed wing, the landing speed of 45 m.p.h. cannot be retained if the loading exceeds about 6 lbs. per square foot, and with this loading it will not be possible to reach 120 m.p.h. with very much more than 15 lbs. per h.p.

Assuming that one is limited to the same total h.p. as before, a total maximum permissible weight of 9,000 lbs. is given by this consideration, which would call for 1,500 sq. ft. of wing surface.

It is, however, possible to compromise to some extent between the qualities of the high lift and the high speed wing. This may be done by using a high speed wing section fitted with trailing edge flaps, which are pulled down to increase the camber and reduce the landing speed. It may also be accomplished by using an intermediate form of wing without flaps.

Taking 7½ lbs. per square foot as the loading to be used, and relying on one or other of these expedients to look after the landing speed, the maximum total surface will be reduced to about 1,200 sq. ft., and with the higher loading the same weight per horse-power should give a rather better top speed.

The machine shown in Fig. 17 is based on this figure for loading. The estimated total weight is somewhat less than the approximate maximum of 9,000 lbs., and the desired top speed should be reached fairly easily.

The central fuselage is of very nearly the same overall

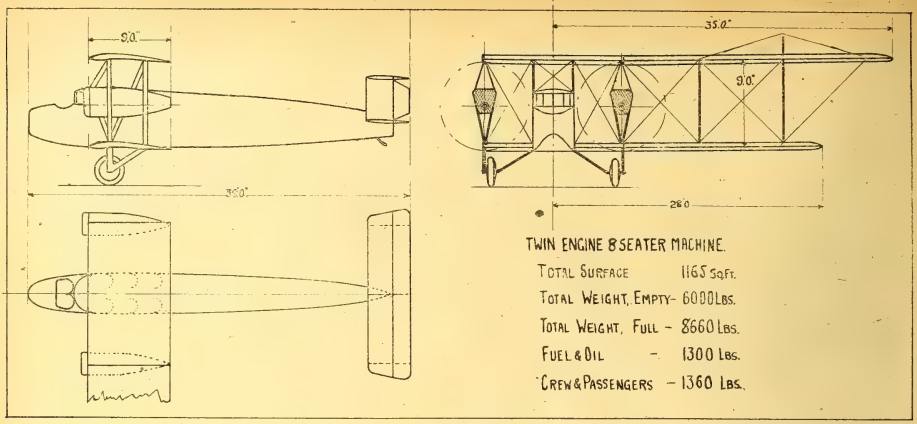


Fig. 17.

dimensions as that of Fig. 16, except that it is about 1 ft. wider at the passengers' cabin, to leave room for a gangway between the seats. The cabin is farther forward relatively to the wings, and the seat for pilot and mechanician is ahead of the cabin.

The main fuel tanks are to be carried as before, beneath the cabin floor.

The centre of gravity of this part of the load is considerably nearer to the desired position for the C.G. of the whole machine, and it is therefore possible to keep the engines considerably farther aft than was necessary in the single-engined machine, without making the machine tail-heavy.

It is doubtful whether, as drawn, the machine would be quite satisfactory in this respect. It would probably be improved by sweeping back the wings on each side of the centre section by about 2 ft. at their tips.

The chord of both top and bottom wings is 9 ft., with a gap equal to the chord, making it a fairly simple matter to carry the power plants sufficiently far forward for the airscrews to clear the leading edge of the wings and to a position giving a reasonable balance.

A biplane tail is carried at the rear of the fuselage. The three sets of intertail struts are enclosed in fairings which act as fins, with rudders hinged to the rear struts.

As compared with Fig. 16, this machine will be rather quicker longitudinally, because the main weights are spread over a shorter total length.

Laterally Fig. 17 will be much slower and heavier on controls because of the side engines.

Fig. 17 will probably have less margin on the top speed requirements, and will climb slower and have a lower ceiling than will Fig. 16, and the speed will fall off more rapidly with height, because of the greater total weight.

The twin-engined machine will be more costly to build, and will require considerably more shed room, unless it is fitted with folding wings, and even then will require considerably larger handling parties when on the ground.

The wider fuselage of Fig. 17 will allow rather more comfortable seating arrangements for the passengers, and with the gangway between the two rows of seats an entrance to the cabin at the aft end through the floor of the fuselage can be arranged very simply.

The twin-engine arrangement gives rather greater security against the effect of engine breakdown, and may on this account justify the use of this type for the passenger-carrying work, but in every other respect the twin-engined machine in this case is the inferior.

This point of the superior reliability of the twin-engined machine appears to have been considerably over-emphasised in the past.

It is undoubtedly true that it is less likely that both engines of a twin-engined machine will fail at the same time than that a single engine will fail.

It is also a fact that any reasonably designed twin-engined machine with one engine available will at least have a greater choice of landing grounds than will a machine whose only power plant has broken down.

But only under exceptional circumstances will a twin-engined machine with only one engine running be able to complete its stage.

Generally the failure of one engine will force a landing at the first available landing ground for the overhaul of the faulty engine. There will, of course, be less risk of being forced to land on unsuitable ground, and therefore less risk of crashing because of engine failure.

But on the other hand the multiple-engined machine involves greater complication in all those accessories of a power plant installation which experience shows to be most liable to derangement in flight.

Petrol systems are apt to be complicated with long lengths of fuel supply piping, giving greater chances of fracture or choking.

Engine controls are necessarily less direct in their action, and therefore more apt to give trouble, and a failure, or partial failure, of one of the twin engines occurring when taking off or about to land may cause a crash which would not occur as a result of the failure of a single central engine.

The superiority of the twin-engined machine is therefore practically confined to a considerably reduced risk of crashing through forced landings caused by engine failure, and this superiority is to be purchased only at the price of a greater liability to partial engine failure caused by the more complicated power plant arrangements which are usually necessary.

Under present conditions the greater safety to life and limb which can be obtained with twin engines, entirely as a result of the better choice of landing grounds when one engine does fail, may justify the use of twin engines even where the single-engine machine is otherwise superior.

With improving reliability of the engines themselves, and, more important still, with proper precautions against failure of the innumerable details of petrol, ignition, and control accessories, it is quite possible that the single-engined machine may eventually come to be regarded as more reliable than the twin-engine type.

(To be continued.)



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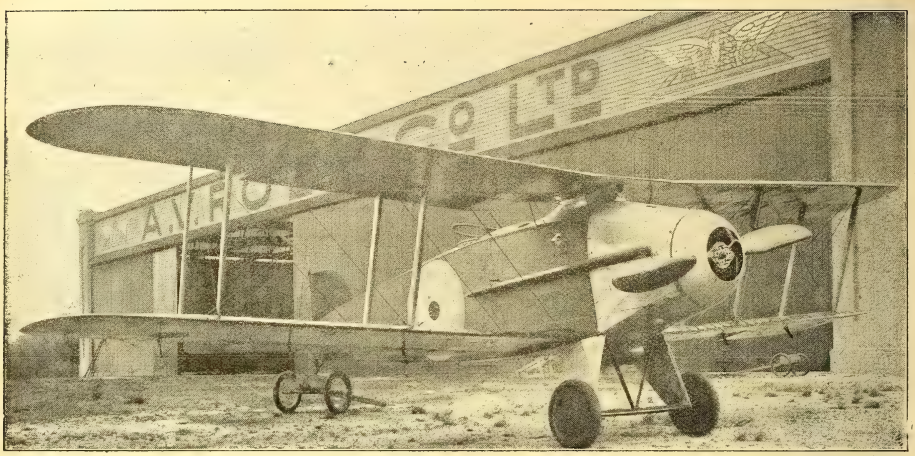


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A. V. Roe & Co., Ltd.—(*Continued.*)



Three-quarter Front View of the Avro Two-seater Fighter, Type 530. (200-H.P. Hispano-Suiza).

THE AVRO TWO-SEATER FIGHTER.—Type 530.

This machine was originally designed by Messrs. A. V. Roe and Co., in 1915, to meet the needs of the R.F.C. for a fast two-seater fighter. For some reason or other [Presumably because it was too much better than the contemporary R.A.F. product.—Ed.] the machine did not obtain the approval of the authorities, and has never been put into production.

In its design special attention has been given to securing the best possible view for both pilot and passenger.

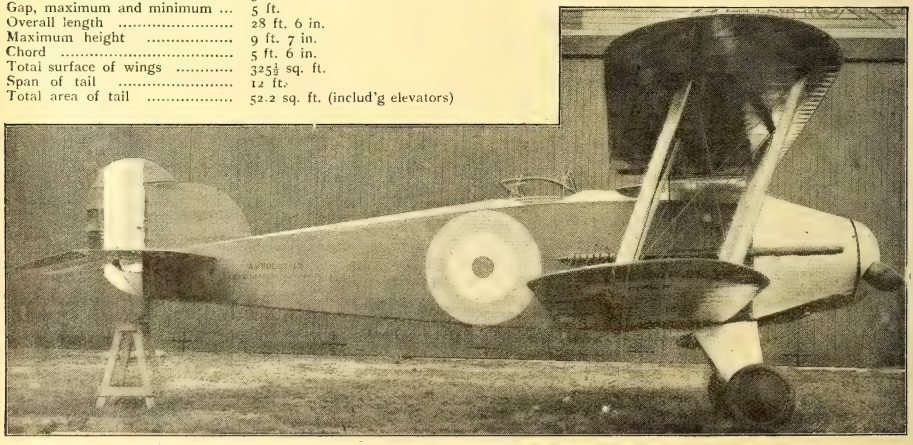
The upper centre section is arranged to be level with the pilot's eye, thus obstructing his view to the smallest possible extent. The lower plane is staggered back and gives him a view downwards and forwards at a very steep angle.

The rear gunners' seat is aft of the trailing edge of the lower wing, so that both occupants have a very wide range of vision.

The following tables give the essential details of the machine :—

SPECIFICATION.

Type of machine	Two-seater Biplane.
Name or type No. of machine	Avro 530.
Purpose for which intended	Fighter or fast two-seater.
Span	36 ft.
Gap, maximum and minimum	5 ft.
Overall length	28 ft. 6 in.
Maximum height	9 ft. 7 in.
Chord	5 ft. 6 in.
Total surface of wings	325½ sq. ft.
Span of tail	12 ft.
Total area of tail	52.2 sq. ft. (includ'g elevators)
Area of elevators	23.8 sq. ft.
Area of rudder	8.8 sq. ft.
Area of fin	4.5 sq. ft.
Area of each aileron and total area	4 × 14.5 sq. ft. = 58 sq. ft.
Maximum cross section of body	14.0 sq. ft.
Horizontal area of body	6½ sq. ft.
Vertical area of body	10.0 sq. ft.
Engine type and h.p.	200 h.p. Hispano-Suiza or Sunbeam "Arab."
Airscrew, diam., pitch, and revs.	Avro Tractor D. 2.97 metres; 2.82 metres; r.p.m. 1,200.
Weight of machine empty	1,695 lbs.
Load per sq. ft.	8.23 lbs.
Weight per h.p	13.4 lbs. (assuming 200 h.p.).
Tank capacity in hours	4 hours at 10,000 ft.
Tank capacity in gallons	40 gallons.
PERFORMANCE—	
Speed low down	114 m.p.h.
Speed at 10,000 feet	102 m.p.h.
Landing speed	58 m.p.h.



Side View, the Avro Two-seater Fighter, Type 530.

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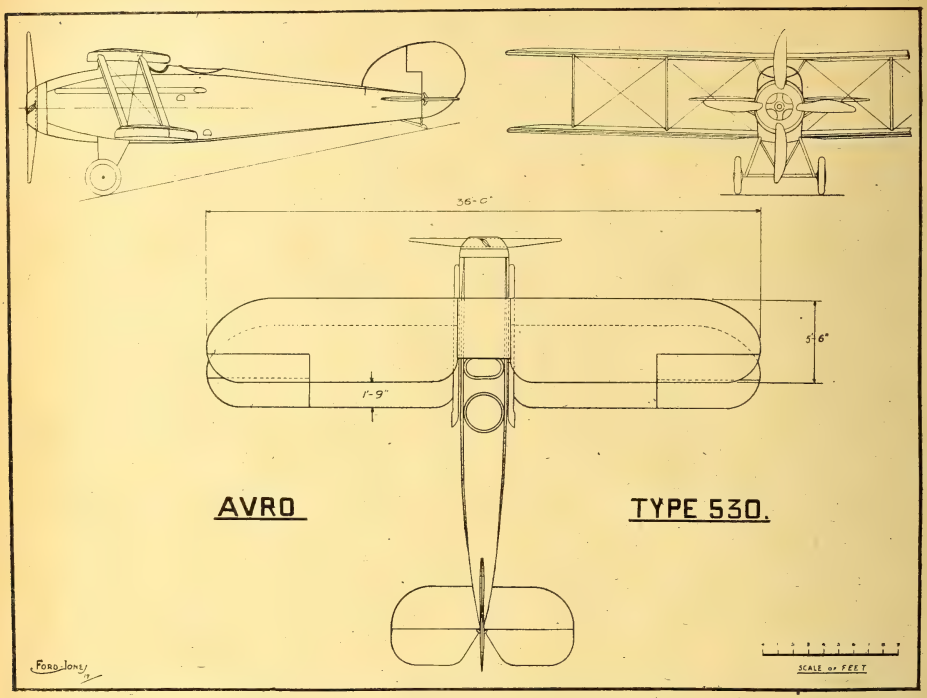


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General Arrangement of the Avro Two-seater Fighter. (200-H.P. Hispano-Suiza).

Climb—	
To 5,000 feet	6½ mins.
To 10,000 feet	15 mins.
Ceiling	18,000 ft. in 40 mins.
Disposable load apart from fuel...	574 lbs.
Total weight of machine loaded...	2,680 lbs.

THE AVRO "MANCHESTER" TWIN-ENGINED BIPLANES.

The two "Manchester" types hereafter described differ mainly in respect of their power plant.

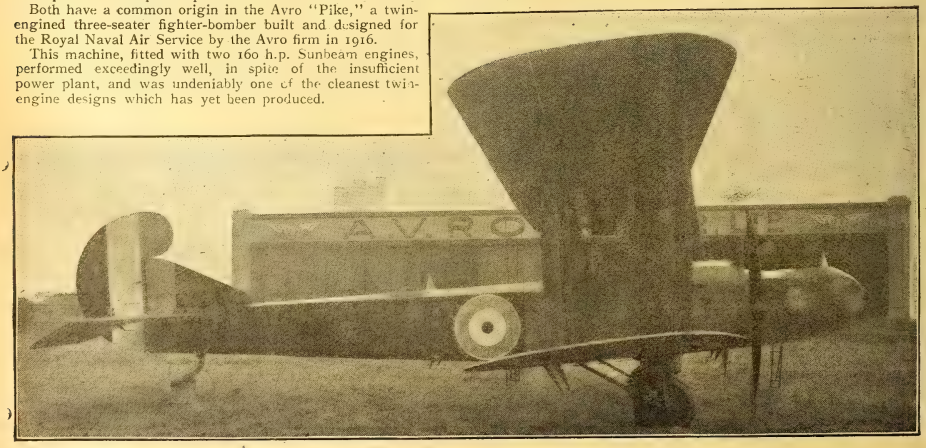
Both have a common origin in the Avro "Pike," a twin-engined three-seater fighter-bomber built and designed for the Royal Naval Air Service by the Avro firm in 1916.

This machine, fitted with two 160 h.p. Sunbeam engines, performed exceedingly well, in spite of the insufficient power plant, and was undeniably one of the cleanest twin-engine designs which has yet been produced.

The "Manchester" Mark 1 and 2 machines differ very little in their general arrangement and outline from this original.

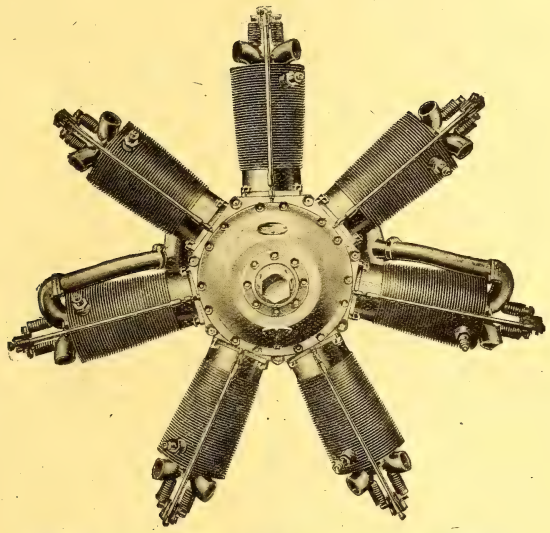
One very interesting feature, which is shown in the scale drawings reproduced of the Mark 1 machine, is the method of balancing the ailerons which is employed.

To the top of the upper king-post of the top plane aileron a small plane is fixed. When an aileron is pulled down this plane is given a positive incidence by the movement of the king-post,



Side View of the "Manchester Mark II" (Two 300-H.P. Siddeley "Puma" Engines).

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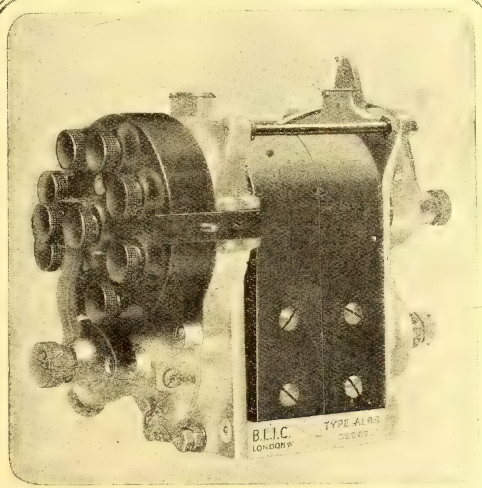
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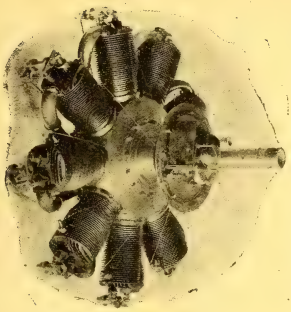


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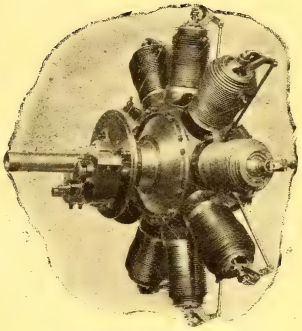
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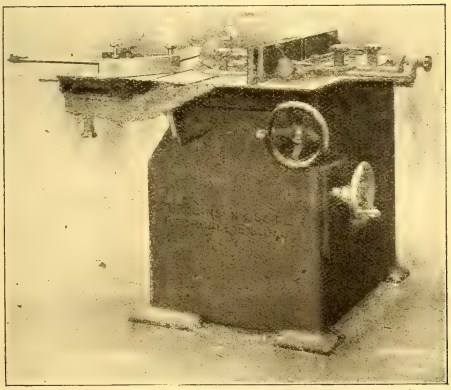
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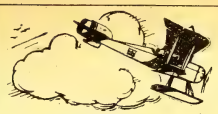
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Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2486.

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830
British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selaero, Phone, London." Regent 1181.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).



The Aeroplane

Accumulators—

The Chloride Electrical Storage Co., Ltd., Clifton Junction, near Manchester. "Chloride, Pendlebury." Central, Manchester, 1638. Pendlebury, 11.

Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamuna, Vic, London." Vic 4830.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone London." 3540 Victoria (3 lines).

Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 220.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle - on - Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

British Aerial Transport Co., Ltd. Head Office: 38, Conduit Street, London, W.1. "Batigram Reg. London." Mayfair 637, 638.
Works: Hythe Road, Willesden, London, N.W.10. "Aerbrirans, Phone, London." Willesden, 2272, 2273.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3006.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hampstead 5551.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 2401 and 4424.

Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2604 (2 lines).

Eastbourne Aviation Co., Ltd., Eastbourne "Aircraft, Eastbourne." Eastbourne 1170.

Glendower Aircraft Co., Ltd., 54, Sussex Place, South Kensington, S.W.7. "Glenacelle, Southkens, London" Kensington 7605 (3 lines)

Gosport Aircraft Co., Gosport. "Flight Gosport." Gosport 217.

Graham-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.
London Office, 12, Regent Street, S.W.1. Regent 2084.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophid, Crickle, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St. James, London." Regent 912.

Manu, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet, "Martinsyde, Weybridge." Woking 331; Byfleet 171

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London." Willesden 2455

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2210-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 5530-5531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954 "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 988 (8 lines).

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin." Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet." Byfleet 1, 2 & 3.

Thames Aviation Works, 141, Curtain Rd., E.C.2. London Wall 9766.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyte, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 4000.

Westland Aircraft, Yeovil "Aircraft, Yeovil" Yeovil 120.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes" Cowes 3.

Airships—

Airships, Ltd., High Street, Merton. Wimbledon 1314.

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 378

C. G. Spencer and Sons, Ltd (See under "Balloons").

Air Transport—

British Aerial Transport Co., Ltd. Head Office: 38, Conduit Street, London, W.1. "Batigram Reg. London." Mayfair 637, 638.
Works: Hythe Road, Willesden, London, N.W.10. "Aerbrirans, Phone, London." Willesden, 2272, 2273.

Aluminium Castings (Sand and Die)

Conn, R. W., 219, Goswell Road, London, E.C.1. "Krankases, Isliug, London." City 3846.

Balloons—

C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronaut, London." Dalston 1893.

Bent Timber Parts—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London." Museum 496.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Bearings (Etonia Cast Phosphor Bronze)

Brown Bros., Ltd., Gt. Eastern St., E.C.1. Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3027.

Blinds—

J. Avery & Co., 81, Gt. Portland Street, London, W. "Velarium, London" Gerrard 6020.

Blowpipes (Oxy-Acetylene)—

Acetylene Corporation of Great Britain, Ltd, The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic. 4830

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic. 3540 (3 lines).

Bolts—

Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16. Dalston 2500 (2 lines).

Books (Aero Engines)—

Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2

Buildings—

Boulton & Paul, Ltd., Rose Lane, Norwich "Aviation, Norwich." Norwich 851.

Rubery Owen & Co., Darlaston, South Staffs.

Cable Coverings and Cable Controls—

The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green" Acock's Green 101 & 102.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2406 (3 lines).

Herbert Terry & Sons, Ltd., Redditch "Springs, Redditch." Redditch 61.

Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4070.

Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3 "Suricodon, Fen, London." Avenue 34 and 35.

Clothing—

Burberry's, Ltd, Haymarket, S.W.1 Regent 2165.

Dunhill's, Ltd., Euston Road, N.W.1 "Dunsend, London." North 3405-6.

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Central Aircraft Co., High Road, Kilburn, N.W.6 "Aviduction, 'Phone, London" Hampstead 4403 & 4404

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Aeros, Richmond" Richmond 1681.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England "Thompson Bros., Bilston" Bilston 10.

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. "And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1 "Tetrafree, Piccy, London" Gerrard 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London" Regent 4046.

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyprem, Piccy, London" Gerrard 288.

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 340.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries "Mocar, Dumfries" Dumfries 281-282.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd (Salmson), 87, Victoria Street, London, S.W.1 "Aeroflight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge" Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith" Hammersmith 1910.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London" Gerrard 8026.

Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1 "Rolhead, London." Gerrard 1634-36.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry Coventry 954 "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton "Moorfield, Wolverhampton" Wolverhampton 1085.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1 "Ehrenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames "Motors, Walton-on-Thames" Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1084.

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7 "Juno, London" Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 260, Bradford Street, Birmingham "Fullerenheit, Birmingham" Midland 1261.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London" Willesden 2480.

Electric Cables—

E. Kalker and Co., Coventry "Kalker, Coventry." Coventry 148.

Johnson & Phillips, Ltd., Charlton, London, S.E.7 "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7 "Juno, London" Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W. "Installing, Eusroad." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1 "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch "Springs, Redditch" Redditch 61.



Buyers' Guide

Fluxes—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines)

The Auto Controller Co (Fluxite), Victoria Road, Bermondsey, Eng

Flying Boat Builders—

Gosport Aircraft Co., Gosport "Flight, Gosport." Gosport 217.

Furniture (Office)—

Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6179.

Galvanising—

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—

J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17

Voucher, Co., Auto Tool Works, Walsall "Voucher Walsall." Walsall 0190.

Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham" East 407.

Glue—

Cannon, B., & Co., Ltd., Lincoln. London Office, 120, Cannon Street, E.C.4. "Beecofin, Cannon, London."

Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid.) "Exeroiden, 'Phone, London." Avenue 4011-2.

Meudine Co., 8, Arthur Street, E.C. Bank 5873.

Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Hack Saw Blades and Machines—

Victor Saw Works, Ltd., 2 and 3, West Street, Finsbury Circus, London, E.C. "Vicsaw, Phone, London" London Wall 1880.

Heating and Ventilating—

Chas. P. Kinnell and Co., Ltd., 65 & 65A, Southwark Street, London, S.E.1 "Kinnell, London" Hop 372 (2 lines).

The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 703.

Instruments—

British Wright Co., Ltd., 53, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

Insurance—

Aviation Insurance Association, 1, Royal Exchange Avenue, E.C. London Wall 4044.

Bray, Gibb & Co., Ltd., 166, Piccadilly, W.1

S. Sackville & Sons, Duchy Chambers, 1, Clarence Street, Manchester

Leather Cloth—

New Pegamoid, Ltd., 134, Queen Victoria Street, London "Pegamoid, Cent, London." City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—

W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London Avenue 7864 (2 lines).

Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 410.

The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Associdual, Coventry." Coventry 278.

Metal Casement Manufacturers—

Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 909 (2 lines).

Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—

Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon, London" City 6342.

Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury" Oldbury 111 (4 lines)

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.

Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1021.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1 "Installing, Eusroad, London." Museum 70.

Rubery Owen & Co., Darlaston, South Staffs.

Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1 "Selsero, Phone, London" Regent 1181.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—

Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast" Belfast 4033-4034-4035.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London" London Wall 9500.

Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham" Central 795.

MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115.

Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegear, Eusroad, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing"

Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—

Anglo-American Oil Co., Ltd., 36, Queen Anne's Gate, London, S.W.

C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2 "Cheery, Cent, London" Central 11305 & 13400.

Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3290-3297.

C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—

British Chuck & Piston Ring Co., Coventry "Rings, Coventry" Coventry 723.

The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield "Ocean, Sheffield" Sheffield 2149.

Presswork—

Rubery Owen & Co., Darlaston, South Staffs.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61.

Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds "Propellors, Leeds" Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich, "Aviation, Norwich." Norwich 851.

Eborn Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames "Ebora, Kingston." Kingston 972.

Integral Propeller Co., Ltd., "Aviprop, Hyde, London" Hendon 9. Kingsbury 104

Lang Propeller, Ltd., Weybridge "Aerosticks, Weybridge" Weybridge 520-521.

Manu, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.

Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 120.

Pyrometers—

The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 20.

Rawhide Hammers—

Ira Stephens, Whitelands Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—

Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 260, Goswell Road, London, E.C.1 "Masticator, Isling, London" City 3811 & 3812.

Safety Belts—

C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester" City 4432.

Screwing Die Heads—

Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0190.

Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch" Redditch 74.

Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines).

Manu, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford "Dynamo, Bradford." Bradford 3700 (3 lines).

Short Bros., Rochester "Seaplanes, Rochester." Chatham 627.

Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights

Brown Bros., Ltd., Great Eastern St., E.C.1.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London" 3540 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London" Willesden 2480.

Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury" Oldbury 111 (4 lines)

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines)

British Metal (Kingston), Ltd., Kingston-on-Thames.

Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—

The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830

British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.

Rubery Owen & Co., Darlaston, South

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London" Victoria 3540 (3 lines).

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Solder Manufacturers—
Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Sparking Plugs—
Brown Bros., Ltd., Great Eastern St., E.C.1
Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 255.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Robinhood Engineering Works, Ltd., Newlands, Putney Vale, S.W.15. Makers of KLG Plugs. "Kaelgee, Phone, London." Putney 2132-3.

Springs—
Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines)

Steel—
Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield." Central 4522-3-4.

Steel Tubes for Aeroplanes—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbarv." Oldbury 111 (4 lines)

Tapes and Smallwares—
MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.
C. E. Matthews & Co., Ltd., Castle Works, Bermondsey Square, S.E.1. "Webbance, Berm, London." Hop 4058.

Timber—
Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London. Museum 496. Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Time Recorders—
Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—
Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349

Turnbuckles—
Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery Owen & Co., Darlaston, South Staffs.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston." Museum 70 (4 lines).

Tyres—
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Central 3880 (5 lines).
The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—
Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Varnishes—
The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjap, Phone, London." Mayfair 6347 (3 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—
Terry, Herbert, & Sons, Ltd, Redditch. "Springs, Redditch." Redditch 61.

Welding and Cutting Plant—
Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London" Vic 4830.
Imperial Light, Ltd, 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Welding Repairs—
Imperial Light, Ltd, 123, Victoria Street, London, S.W.1. "Edibrac," Phone, London." Victoria 3540 (3 lines).

Wind Shields—
Auster, Ltd., 133, Long Acre, W.C. "Windfector, London." Regent 5070.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

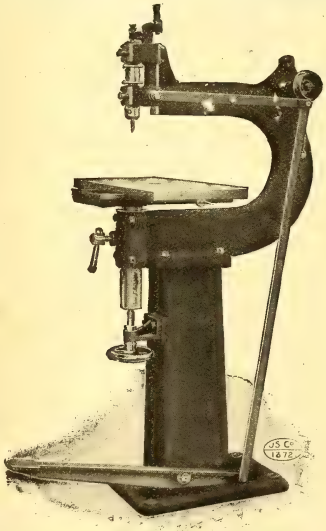
Wire Gauze—
Greening, N., & Sons, Ltd, 16, Finsbury Street, London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.

Wire and Cables—
Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

Wirework—
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Woodworking Machinery—
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Sagar, J., & Co., Ltd., Halifax. "Sawtooth," Halifax." Halifax 136.
Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.

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High Speed Routing, Carving and Recessing Machine.

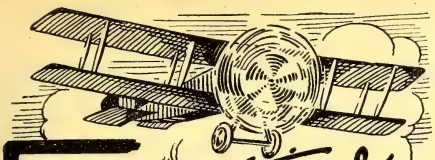
This Machine is used for grounding or routing out the surplus material in sunken moulded panels and carvings all kinds of light trenching, recessing, boring, etc., and is particularly useful for Aircraft Factories. It is made in different sizes fitted with different kinds of sliding tables, and we shall be pleased to send fullparticulars of the various Machines on request.

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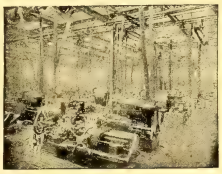
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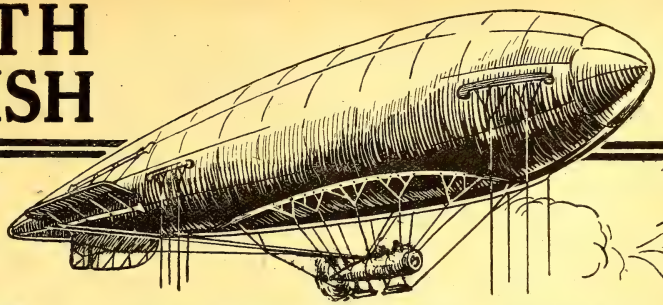
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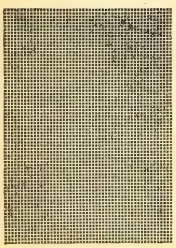
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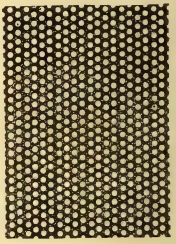
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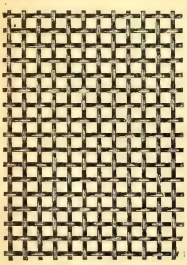
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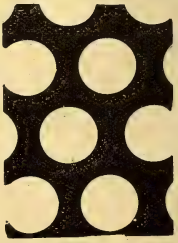
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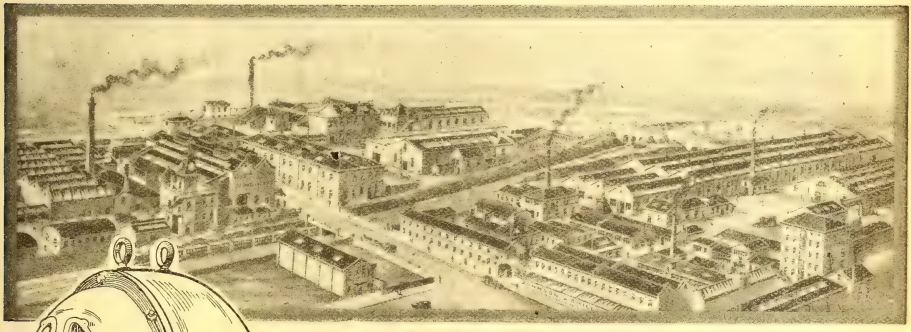
and

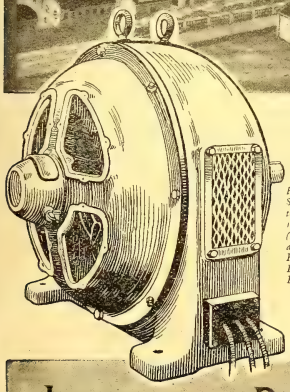
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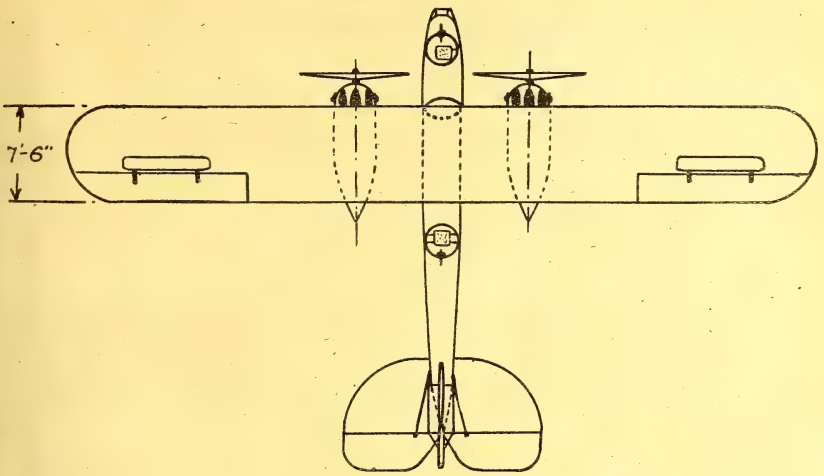
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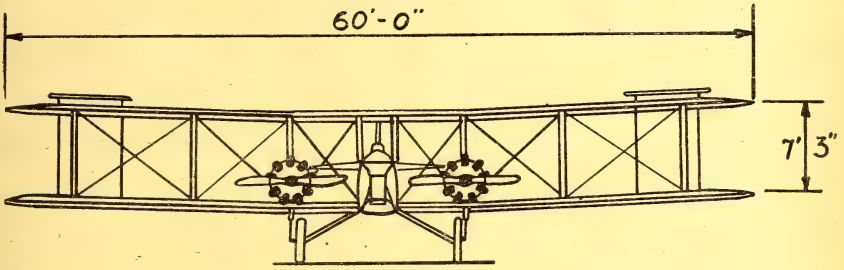
"Beardmore" reputation dates back to pre-war days. While many engines were in their experimental stages, the Beardmore was making history. During the war, "Beardmore" helped most when the need was greatest and to-day it is unsurpassed. Watch "Beardmore" developments.

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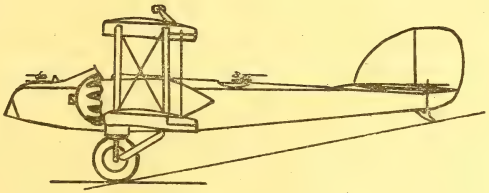
KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



PLAN.



FRONT



SIDE ELEVATION

AVRO MANCHESTER MARK I.

2 - A.B.C. DRAGONFLYS.

FORD JONES 19

General Arrangement of the Avro "Manchester Mark I" Three-seater. (Two 320 h.p. A.B.C. Dragon-Fly Engines).



Three-quarter Front View of the Avro "Manchester Mark II" (2 Siddeley "Puma" Engines).

and gives an appreciable lift. As the plane is ahead of the aileron hinge, this lift assists in holding the aileron down, and so partly balances the aileron.

When the aileron is pulled up the balancing plane is given a negative incidence, and exerts the required balancing force tending to hold that aileron up.

Both types are three-seaters, with pilot's cockpit under the leading edge of the wings, observer's seat and gun turret in the nose of the fuselage, and a rear gunner's cockpit well aft of the main planes, whence a very wide field of fire is obtained.

THE TWIN-ENGINED AVRO.—"Manchester Mark I."

Type of machine	Three-seater Twin-engined Biplane.
Name or type No. of machine	Avro "Manchester Mark I."
Purpose for which intended	Photography, reconnaissance, bombing.
Span	60 ft.
Gap, maximum and minimum	7 ft. 3 in.
Overall length	37 ft.
Maximum height	12 ft. 6 in.
Chord	7 ft. 6 in.
Total surface of wings	843 minus 30 (area of nacelles).
Span of tail	13 ft.
Total area of tail	82 sq. ft. (including elevators)
Area of elevators	32 sq. ft.
Area of rudder	19 sq. ft.
Area of fin	11.7 sq. ft.
Area of each aileron and total area	31 sq. ft.; total 124 sq. ft.
Maximum cross section of body	14.3 sq. ft.
Horizontal area of body	80 sq. ft
Vertical area of body	111 sq. ft.
Engine type and h.p.	A.B.C. "Dragon-fly"; 320 h.p. at 1,650 r.p.m.
Airscrew, diam., pitch, and revs.	Avro Tractor D. 2.9 m.; 2 m.; r.p.m. 1,600.
Weight of machine empty	4,049 lbs.
Load per sq. ft.	8.06 lbs.
Weight per h.p.	10.3 lbs.
Tank capacity in hours	5¾ hours at 10,000 ft. (including climb).
Tank capacity in gallons	183 gallons.
Performance—	
Speed low down	128 m.p.h.
Speed at 10,000 feet	122 m.p.h.
Speed at 15,000 feet	115 m.p.h.
Landing speed	45 m.p.h.
Climb—	
To 5,000 feet	4½ mins.
To 10,000 feet	11 mins.
To 20,000 feet	Service ceiling, 40 mins.
Disposable load apart from fuel	1,007 lbs.
Total weight of machine loaded	6,586 lbs.

No bombs carried for this performance.

THE TWIN-ENGINED AVRO.—"Manchester Mark II."

Type of machine	Three-seater Twin-engined Biplane.
Name or type No. of machine	Avro "Manchester Mark II."
Purpose for which intended	Photography, reconnaissance, bombing.
Span	60 ft.
Gap, maximum and minimum	7 ft. 3 in.
Overall length	37 ft.
Maximum height	12 ft. 6 in.
Chord	7 ft. 6 in.
Total surface of wings	843 minus 26 (area of engine nacelles).
Span of tail	13 ft.
Total area of tail	82 sq. ft. (including elevators).
Area of elevators	32 sq. ft.
Area of rudder	19 sq. ft
Area of fin	11.7 sq. ft.
Area of each aileron and total area	31 sq. ft.; total 124 sq. ft.
Maximum cross section of body	14.3 sq. ft.
Horizontal area of body	80 sq. ft.
Vertical area of body	111 sq. ft.
Engine type and h.p.	Siddeley "Puma" (boosted); 300 h.p. at 1,600 r.p.m.
Airscrew, diam., pitch, and revs.	Avro Tractor D. 2.9 m.; P. 2 m.; r.p.m. 1,600.
Weight of machine (empty)	4,574 lbs.
Load per sq. ft.	8.76 lbs.
Weight per h.p.	11.93 lbs. (assuming 600 h.p.).
Tank capacity in hours	3¾ hrs. at 10,000 ft., including climb.
Tank capacity in gallons	116 gallons.
Performance—	
Speed low down	125 m.p.h.
Speed at 10,000 feet	119 m.p.h.
Speed at 15,000 feet	112½ m.p.h.
Landing speed	45 m.p.h.
Climb—	
To 5,000 feet in minutes	6½.
To 10,000 feet in minutes	16⅛, 15,000 ft. in 32 mins.
Service ceiling 17,000 ft. in	43 mins.
Disposable load apart from fuel	1,614 lbs.
Total weight of machine loaded	7,158 lbs.

THE AVRO "SPIDER."

The Avro "Spider" is one of the very few examples amongst British aeroplanes of the so-called "wireless" type. The wing structure is entirely supported by a triangulated system of steel tubes, and has neither flying nor landing wires.

The front end of the fuselage is identical in all respects with the forward portion of the type 504 Avro; but it has been shortened up aft of the cockpit. The tail unit is also of the same design as that of the standard training machine, so that fittings already being produced in quantity can be used for the whole of this part of the machine.

This machine has been specially designed as a Single-Seater Fighter. Great attention has been paid to the question of view and manœuvrability. It is extraordinarily quick and light on the controls, and in mock fights, for which it has so far been used, has easily out-manœuvred other machines which have been standardised.

Although the first machine has only been fitted with 110 Le Rhône, it is proposed to fit a much higher-powered engine so as to get a still better performance.

The view in every direction is excellent, as the pilot sits between the main spars of the top plane, and has a perfect view both upwards and downwards, the dimensions of the bottom plane being so small as hardly to obstruct the view at all.

The pilot's cockpit is very roomy and comfortable, and full use can be made of the controls without any obstruction.

The guns are conveniently placed and the ammunition boxes and chutes well arranged.

The engine controls are placed in a convenient position on the pilot's left-hand side, and the hand-pump is in a comfortable position for use.

SPECIFICATION.

Type of Aeroplane	Single-Seater "Fighter."
Aeroplane specification	Avro "Spider."
Engine	180 h.p. B.R.2
Revolutions of engine for stated b.h.p.	1250 r.p.m.



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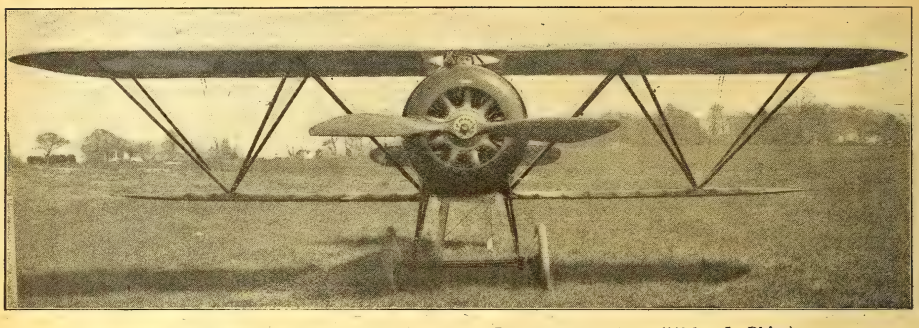
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Front View of the Avro "Spider," showing the Wing Bracing System. (110 h.p. Le Rhône).

ESTIMATED SPEED WITH FULL LOAD AND WITH ALL FITTINGS IN POSITION.

Maximum speed for the above horse-power and revolutions.

	m.p.h.
At ground level	124
At 8,000 feet	121
At 10,000 feet	122
At 15,000 feet	115

Duration of flight at this speed.

At 10,000 feet	2 hrs.
At 15,000 feet	2½ hrs.
Minimum speed with full load near ground	45 m.p.h.

ESTIMATED CLIMB WITH FULL LOAD AND WITH ALL FITTINGS IN POSITION.

	mins.
To 3,500 feet	2.2
To 8,000 feet	5
To 10,000 feet	7
To 15,000 feet	13½
To 18,000 feet	20
To 20,000 feet	26

Pilot, position ..... Between main spars of top plane

AIR-SCREW.

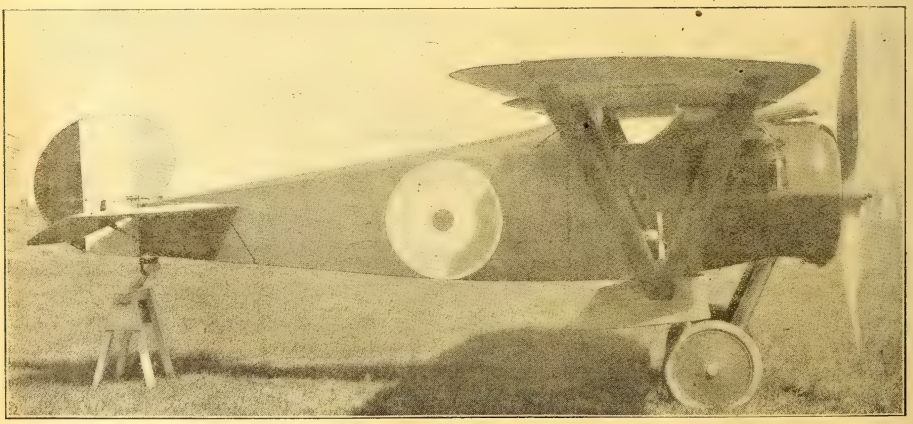
Type	"Avro."
Pitch	9 ft.
Diameter	8 ft. 6 ins.

OVERALL DIMENSIONS—

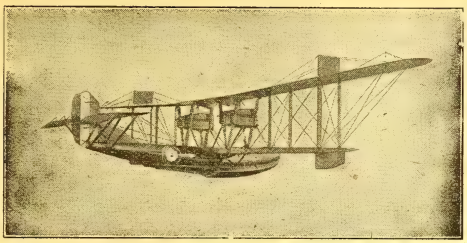
Span of top wings	28 ft. 6 ins.
Span of bottom wings	21 ft. 6 ins.
Span of tail plane	8 ft. 6 ins.
Height overall	7 ft. 10 ins.
Length overall	20 ft. 6 ins.
Chord top wing	6 ft.
Chord bottom wing	2 ft. 6 ins.
Chord tail plane	2 ft. 8 ins.
Chord elevator	1 ft 6 ins

DETAILS OF WEIGHT.

Component.	Weight in lbs.
TAIL UNIT—	
Tail plane	12
Elevator	10
Rudder	10
Total	32
MAIN LIFT STRUCTURE—	
Wings with flaps	170
Interplane struts	70
Interplane wires	5
Total	245
ALIGHTING GEAR—	
Under carriage	25
Main wheels and axle	34
Tail skids	6
Total	65
FUSELAGE—	
Body and engine housing	186
Aeroplane control gear and wires	15
Other details, flying instruments, lighting set, etc.	25
Total	226
POWER PLANT—	**Centre. lbs.**
Engine with magnetos	500
Airscrews, boss and bolts	35
Oil tanks, cooler and piping	10
Petrol tanks, piping and air pressure system	35
Total	580



Side View of the Avro "Spider." (110 h.p. Le Rhône).



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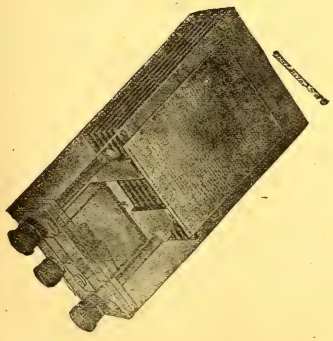
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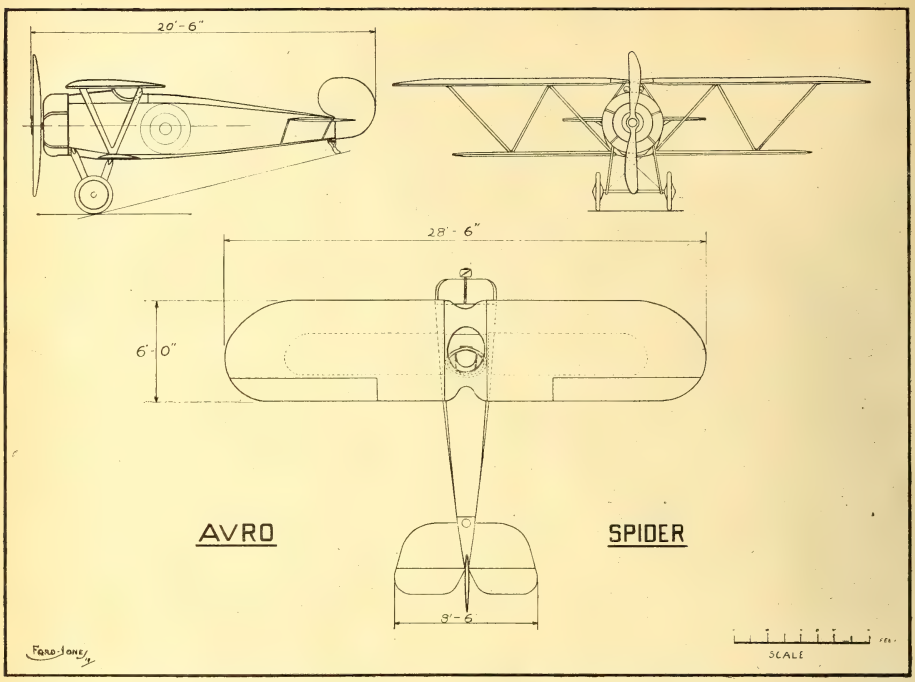
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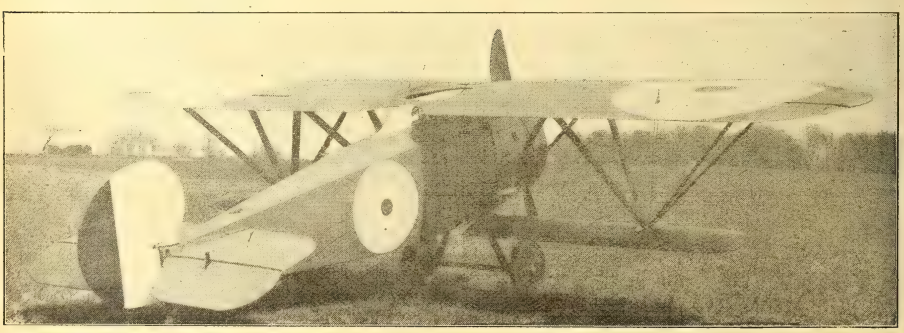
London Office 39 VICTORIA STREET S.W.1.



General Arrangement of the Avro "Spider." (110 h.p. Le Rhône).

Total weight of machine bare	1,148
Armament and Military Load—	
Pilot's gun	70
Mounting and ammunition box	20
Belt and ammunition, 800 rounds	60
Total Gun Load	150
Véry Pistol with cartridges	8
Total reconnaissance load	8
Military Load—	
Total of gun, bomb and reconnaissance load	158
Crew of 1 at 180 lbs.	180
Total military load	338
Weight of Machine in Flying Trim—	
(a) Weight of machine bare	1,148
(b) Military load	338
(c) Petrol 26⅔ gallons	194
(d) Oil 6 gallons	54
Total	1,734

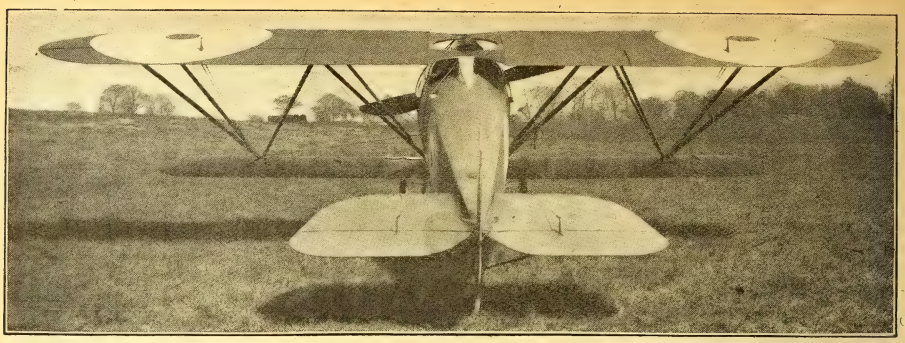
	sq. ft.
Areas—Wings—	
Top	122
Second	45
Total	167
Wing Flaps—	
Top	22
Total supporting surface	189
Tail Plane	17·5
Elevators	11
Rudder	7·8



Three-quarter Rear View of the Avro "Spider." (110 h.p. Le Rhône).


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Rear View of the Avro "Spider." (110 h.p. Le Rhône).

LOADING—	lbs.	Size of Standard Wheels fitted	700 mm. × 78 mm.
Loading on wing surface per sq. ft.	9.15	MATERIALS—	
Weight fully loaded per h.p.	9.65	Wing spars	Built up spruce.
Weight carried on tail when in flight	Nil.	Wing struts	Steel tubes.
CONTROL—		Body struts	Spruce.
Type of aeroplane controls	Stick and V foot bar.	Undercarriage	Steel tubes
Position of engine controls	On left-hand side of body.	Longerons in body	Spruce.
Rudder bar adjustable		Shock absorber	Rubber cord.
Tail skid controllable		Petrol tank	Behind pilot.
Load on tail skid when loaded ready for flight	100 lbs.	Pressure feed capacity	26½ gallons
Tail plane adjustable on the ground but not in the air from pilot's seat		Material	Tinned steel.
BRACING—		Weight empty	20 lbs.
Wings—(a) Internal	High tensile wire.		
(b) External	Steel struts.		
Body	High tensile wire.		
Undercarriage	Cable.		
UNDERCARRIAGE—			
Type	"Vee" Type.		

MINIMUM FACTOR OF SAFETY—front spars	Top 13	Bottom 9½
rear spars	13	
Rear wing bracing.		
front struts	6	6
rear struts	6	6

Range of movement of centre of pressure ..... .20 to .5 of chord.

APROPOS SUNBEAMS.

The testing of the various new British airships makes it of interest to note that each of these airships is driven by five "Maori" Sunbeam-Coatalen engines of 275 h.p. each. These engines on test have given the most satisfactory results, and it is interesting to note that when the Armstrong-built R.33 was brought out for test and the signal was given to start up the engines from their cold state all five engines were running inside 70 seconds. The airship thereafter did a test of 4½ hours and developed a speed of 53 knots, which approximates to 60 m.p.h.

A rumour has appeared in various papers that the Beardmore-built R.34—which in her general design is a sister ship to R.33—was to be fitted with bigger engines, and apparently this rumour led some people to think that the "Maori" Sunbeams were not giving satisfaction. The origin of the rumour seems to have been that the bigger airships which are in process of construction are to be driven by "Cossack" Sunbeam-Coatalen engines of 350-h.p. each, so that evidently the "Maori" engine has given results which justify the airship people in using bigger Sunbeams for the bigger ships.

Quite recently a very good flight was made with a "Matabele" Sunbeam-Coatalen engine of 425-h.p. in an Airco D.H.4 machine. Practically without help from the wind this machine flew from Castle Bromwich, near Birmingham, to Hendon in 35 minutes, which gives a speed of 150 m.p.h. over the ground. The "Matabele" is an engine very similar to the "Cossack," but driving a geared airscrew instead of having a direct drive. The petrol consumption of the engine has proved to be quite low, being 0.52 pints per h.p. per hour.

It is of further interest to note that the "Cossack" Sunbeam-Coatalen has had great success in France, where it is used very largely in the flying boats built by M. Tellier. These Tellier flying-boats are about the largest of the single-engined flying-boats used by the Allies, and have made the journey from France to Corsica successfully on several occasions.

The "Cossack" engine has proved so satisfactory in the Tellier that it is commonly said in the French Naval Aviation Service that the engine should not be called the "Sunbeam" but the "Sublime" (the French pronunciation of the latter word is necessary to appreciate the jest).

Very severe tests were carried out at St. Raphael, the big French Naval Aviation depôt, in April, 1918, with the Tellier-Cossack combination. Carrying a load of 1,050 kilogrammes, the boat reached 2,000 metres in 19 minutes 30 seconds; with a 1,300 kilo. load, 2,000 metres took 22 minutes 10 seconds; with 1,520 kilos. the time was 28 minutes 25 seconds, and with 1,632 kilos. the time was 35 minutes 30 seconds. The petrol consumption was 18.4 gallons per hour of petrol and 7.2 gallons per hour of oil for the 350-h.p. "Cossack," so that evidently the engine shows quite high efficiency.



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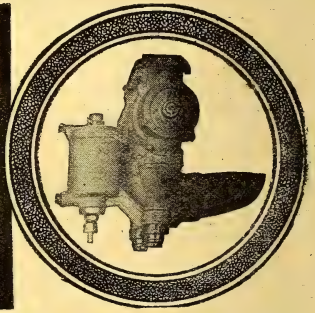
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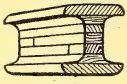
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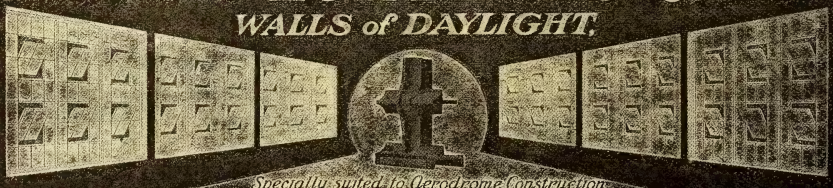


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FIRST EXPERIENCES OF CIVILIAN FLYING.

Some very interesting comments on the results of the Easter flying have been received from an R.A.F. officer, now demobilised, who is himself organising an extensive scheme for pleasure flying during what is left of this year.

The officer in question, Lieut.-Col. G. L. P. Henderson, M.C., R.A.F., took part in the flying at Hamble during the Easter holidays, and states that during three days' work, although very little publicity and advertising were possible in the short period available, 359 passengers were taken up for trips averaging about 10 minutes' duration each.

The machines used were two three-seater Avros and one two-seater, all fitted with Mono-Gnômes. The best day's work for one pilot with one machine was 75 passengers. The public seemed content with anything between 5 and 10 minutes per trip, and, when large numbers were waiting, the trips were somewhat reduced in length. There were no breakages and no engine troubles. The only replacement on the three machines was one wheel, the tyre of which had punctured. Over 100 loops were made in the course of the meeting.

The spirit of the public seemed to be divided about equally between 50 per cent. who were very anxious to do all kinds of stunt flying, and 50 per cent. who wanted to do as little as possible. The latter half all seemed very brave after they had landed, and expressed great regret that they had not emulated the others. The weather conditions throughout the holiday were ideal, according to modern ideas, though the strong north-east wind which was blowing on Monday would have interfered seriously with flying before the war.

Col. Henderson, who is a believer in small machines, remarks that the passengers who went for trips on big machines must feel envious of Avro passengers whose sensations were those of true flying, for numbers of them can now say that they have performed all possible stunts.

The writer further remarks that, judging from a recent leader in the "Times," there is a tendency to suggest that civilian flying must be limited to the slow and sure kind, but that he himself is convinced from the spirit of the public at Hamble that stunts at safe altitudes must be allowed, though it is essential that only capable pilots and safe machines in the best of conditions should be permitted to do such flying. He further suggests that the liberty of the subject is such that he may, if he wishes, hire a pilot on purpose to perform "aerobatics" for him.

The writer also draws attention to General Seely's recent remark that "Flying is now as safe as fast motoring or travelling in express trains." He himself (he is one of our most experienced war pilots) does not believe that flying is nearly as safe as either, and the lessons which he draws from the recent accidents to Major Wood on the Short machine, to the late M. Vedrines, and from the Wey Hill accident to the Handley Page are as follows:—

1. That no power on earth, much less the A.I.D., and the Air Ministry, can possibly prevent the ordinary run of flying accident, which is controlled by the law of averages.
2. The real safeguards are:—
   - A. Careful selection of pilot.
   - B. Careful selection of machine.
   - C. The most important of all. The essential fact that all commercial enterprises must be run as financial successes.

As he rightly suggests, this last consideration of financial success must impose restrictions both on stupidity and recklessness which are much more powerful than any number of men in "Bolo" blue standing round an aerodrome like hens watching young ducklings going for their first swim. He is entirely right in saying that, if none but "A.1. at Gosport" were allowed to fly, and then only on approved machines, there would be no harm in permitting absolute freedom of movement and in giving greater freedom as to the use of landing grounds.

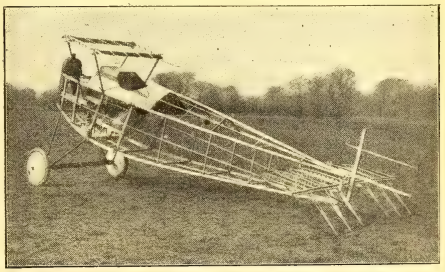
The writer also makes the interesting suggestion that, in order to do away with all unnecessary Government control, every civilian pilot should be subjected to a very severe flying test under Government supervision, and that, subject to his passing this test, the pilot should then be given a special certificate which would permit him to fly where he liked, providing that the owners of the ground were agreeable. There could then be no question of favouritism or preference. The suspension of this certificate would be the penalty of any foolhardiness, and one quite agrees with the writer in thinking that along this road is the right course towards popularising flying.

A SPORTING-TYPE AVRO.

The latest addition to the number of small, cheap low-powered machines now being designed for the use of the sporting pilot is a very neat single-seater which has been designed by Messrs. A. V. Roe and Co. for a 35-h.p. Green engine.

It is understood that the first of the type is now ready for trials at the firm's experimental works at Hamble, and it is hoped that a complete description will be available within the course of the next few weeks.

The attached photograph of the machine partly erected in skeleton form gives a very fair idea of the general characteristics.



The New 35-H.P. Avro.

AERIAL TRANSPORT.

Lieut.-Col. Piccio has been detached to France to superintend arrangements in connection with pending aerial transport of international import. It is known that a squadron of C. biplanes has not returned with the other Italian Forces which were detached to the French front.

FICTITIOUS FIGURES ON FLYING.

The following letter has been received :--

Sir,—The article by " Engineer Officer ' entitled " Fictitious Figures on Flying," which appeared in your issue dated April 9th, should, I imagine, be taken more as a counterblast to some of the very wild prophecies as to the immediate future of aerial passenger-carrying scheme than as a really careful estimate of what the cost of such schemes is actually likely to be.

Regarded in this light, I am entirely in accord with the objects of the article. The piffulent tosh about commercial aviation with which some of the daily Press habitually regale their readers, and the utterly misleading imitations of cost estimates for commercial air services which emanate from certain sources popularly supposed to be well informed, are only too likely to prepare the way for the fraudulent promoter of aerial transport companies.

An Effort that Must be Defeated.

There is little doubt that this is the actual object aimed at; and if the development of sound aerial enterprise on a commercial basis is not to be arrested for some years, this effort must be defeated.

At the same time an undue pessimism is almost equally to be deprecated.

It seems to me that " Engineer Officer " has erred nearly as far to the pessimistic side as the most interested optimist has attempted to mislead us on the other.

Taking his " Postulated Principles " seriatim, there is nothing to object to in the first six items.

A Pessimistic Estimate.

In taking the life of a machine as averaging one year, I think he is a little depressed, but the point is doubtless arguable. In assuming as he does that an engine will be worn out and worth nothing after 180 hours of flying, I feel certain that he is wrong. Certainly if he puts an engine into a machine and runs it till it breaks up and then replaces it, the average life may be even less than this.

If each machine is fitted with two complete sets of engines, and if each engine is removed and replaced by a spare and thoroughly overhauled before going back into service at regular and fairly frequent intervals, I believe many modern engines would live indefinitely, and their careers need only terminate when an engine was available which was so much an improvement that the extra earnings obtained by its use would pay the interest on the capital needed to purchase it.

Such maintenance would cost money, probably 5 per cent. of the prime cost of the engine for every 100 hours' running for materials alone.

Taking the estimated cost of machines per year, that given for each engine is £2,000. This seems to indicate that each engine is round about 400 h.p., and that the machine h.p. is therefore about 1,600. This agrees fairly well with his figure for petrol consumption, which at 1 gallon per mile at 100 m.p.h. is 100 gallons, say 750 lbs.. per hour, or at the rate of ½ lb. per b.h.p. per hour for 1,500 b.h.p.—a normal figure.

The Handley Page type V/1,500 is the only British machine equipped with such a power plant for which any particulars are at the moment available. Without engines it ought to be possible to sell it, given a reasonable demand, at the £10,000 quoted by the author of the article.

Available Figures.

According to the figures which are available, this machine empty weighs 15,000 lbs.; and fully loaded 30,000 lbs., or a disposable load of 15,000 lbs.

Assuming that it is not desired to load the machine to this extent, and allowing for only 10,000 lbs. of total load to carry out the 500-mile stage at 100 m.p.h., 5 hours' full power fuel must be carried. Allowing for adverse weather conditions let this be increased to 6½ hours.

This would weigh 5,200 lbs., leaving 4,800 for crew and goods or passengers—say 4,500 lbs. of useful load.

That is to say that " Engineer Officer " appears to have based his figures on a machine meant to carry two tons, but which on an average only carries three-quarters of a ton of paying cargo.

Prohibitive Cost.

If an aeroplane service is carried on under conditions such as this it is bound to be prohibitively costly. But these conditions would indicate extremely bad traffic management.

If the traffic is so irregular that the average cargo is only three-quarters of a ton, although on some trips it may be necessary to carry two tons, it will be more economically handled by machines of about three-quarter ton capacity, running one, two or three machines on each trip according to the day's traffic.

If "Engineer Officer's" machines averaged three-quarters of their full load instead of only three-eighths, his cost per ton mile, man mile, or letter mile would be halved at once.

If a company operating such a service as is now being considered has to maintain its own aerodromes for its own use, and they are used for no other purpose than for the one service, the resulting costs might be as great as is suggested.

It is, however, extremely unlikely that anyone would attempt to run a regular service over a 5,000-mile route before a fairly well developed aerial transport system had been developed in the more densely populated parts of the earth. Such a service, when developed, would be arranged to use the aerodromes already established to as great an extent as possible, and the service would have to bear only a fraction of the whole cost of maintaining the aerodromes.

Taking the same case as that dealt with by " Engineer Officer," but assuming that his traffic manager does not use machines of two tons capacity until his traffic warrants it, and that an average load of one and a half tons per trip can be relied on, the figures work out at :—

Total machines employed, 25.

Life of machine, one year.

Life of engines, five years (1,800 hrs. flying), scrapped, obsolete.

Cost of engine maintenance, 20 per cent. of initial cost per annum.

Cost of machines per annum, £10,000 each. Each machine has two sets of engines, eight in all. £2,000 each is roughly the price which would have to be paid to-day for such engines, though their real value is nearer £1,000. Leaving the figure as in the original, the cost of engines for each machine is £16,000, with a further £16,000 as the cost of replacement of parts; total, £32,000 for a life of five years, or £6,400 per annum.

This cost applies only to the 10 machines in regular service. The 10 ready for flight and the 5 spares would cost considerably less, because the whole of the flying time has been credited to the 20 sets of engines allotted to the machines in actual service.

Unnecessary Expense.

It would be unnecessary to provide duplicate engines for the reserve machines, as the spares for the service machines are equally spares for the reserves. It would be perfectly safe, therefore, to take 35 sets of engines as the total required.

The 15 sets of engines which are not in service will cost nothing in the form of materials for maintenance.

For total cost of machines, therefore, one arrives at :—

25 machines at £10,000	£250,000
35 sets of engines at £3,200 p.a.	£112,000
Renewals of 20 sets of engines at £3,200 p.a...	£ 64,000
Total cost per annum	£426,000

Allowing for 10 per cent. of the original cost of the machines alone as the value of left-over machines and parts at the end of the year, the total cost of machines and engines becomes £401,000 per annum.

The average load has been increased to 1½ tons, and the miles flown per annum remain at 720,000.

The yearly ton mileage is then 1,080,000.

The figure for petrol will not be changed, though 2s. 6d. per gallon is a very high figure. Probably by the time 1,500 h.p. machines are running services of this kind the fuel employed will be a crude oil at round about 8d. per gallon.

Pilots remain at £25,000 p.a.

Cost of Aerodromes.

With regard to aerodromes it will be assumed that, allowing for the use of some already established aerodromes employed by other services, this service has only to bear on an average one-half of the total cost of aerodromes.

The aerodrome cost is then £50,000 p.a.

All the other figures remain unaltered, except insurance, which is charged at the same rate on the same items.

Total costs are therefore :—

Machines and engines	£401,000
Petrol	90,000
Oil	18,000
Pilots	25,000
Aerodromes	50,000
Offices	30,000
Labour (engineers and riggers)	100,000
Car services	20,000
Insurance	95,200
	£819,200

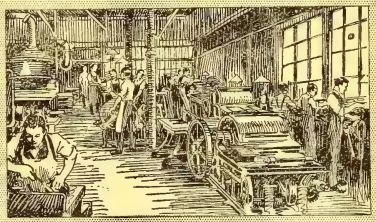
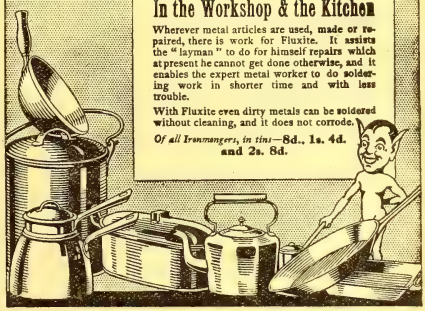
This is £0.75 per ton mile, which with the addition of 30 per cent. profit gives £1.00 per ton mile as freight charges, instead of " Engineer Officer's " figure of £2 13s.

The half-ounce letter carried 5,000 miles would now cost 1s. 7d., and the 200 lb. man carried the same distance would cost £450, instead of the original figures of 3s. 9d. and £1,150.

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With Fluxite even dirty metals can be soldered without cleaning, and it does not corrode.
Of all Ironmongers, in tins—8d., 1s. 4d. and 2s. 8d.

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Taking the type of conditions which 'Engineer Officer" presumably had in mind when he based his estimates on the use of two-ton machines, and assuming that the cargo per trip will vary between a half ton and two tons, with an average of three-quarters of a ton, giving a total ton mileage of 540,000 per annum, what will the cost be under the worst conditions if the service is run by machines with a capacity of three-quarters of a ton of paying cargo?

To deal with the maximum load per trip of two tons, three of these machines will be required for each stage, or 30 in all. Two reserve machines at each stage, or 20 more, plus 10 spares should be ample.

A Revised Estimate.

Assuming the costs to be proportional to the carrying capacity, which is probably unfair to the smaller machine, each machine will cost £3,750, or a total of £225,000 for the 60.

On the same basis each set of power plant will cost £3,000.

Each of the 30 service machines should have duplicate power plants, and each reserve machine one only, making a total of 90 power plants, £270,000. Allowing, as before, 5 years before obsolescence, this is £54,000 per annum. Under the worst possible traffic conditions, consistent with the assumption made, the average load carried by the machine actually flown on any one trip need never fall below half their full capacity, and the maximum machine mileage need not exceed 1,440,000 miles per annum.

This is 14,400 hours engine running, which, allowing 5 per cent. of the prime cost of a complete power plant per 100 hours, as the cost of engine renewals gives 7.2 times the cost of one unit as the renewals cost per annum, or £21,600 per annum for engine renewals.

Five pilots per stage would give ample security against illness and afford ample reliefs; 50 pilots at £500 = £25,000 per annum.

Petrol taken in proportion to the useful load capacity of the machines would run to ⅛ gals. per mile—540,000 gals.—£67,500 per annum at 2s. 6d. per gallon.

Oil in the same proportion is £13,500.

Aerodromes will remain at £50,000, and offices at £30,000. There will be a smaller number of engineers and riggers required than with the large machines, so the cost of these may reasonably come down to £75,000 per annum.

The total cost per annum then becomes:—

Machines	£225,000
Engines	54,000
Engine maintenance	21,600
Petrol	67,500
Oil	13,500
Pilots	25,000
Aerodromes	50,000
Offices	30,000
Engineers	75,000
Cars	20,000
Insurance	75,000
Total	£656,600

which is £1.22 per ton mile, or, allowing for 30 per cent. profit, £1 11s. 8d. per ton mile, which figure, it will be remembered, applies to running at an average of only one half full load on the machines actually flown, and at one-third of the maximum load capacity of the whole fleet. Ex. R.N.V.R.

POST-BELLUM POLICIES.

By The Special Commissioner of "The Aeroplane."

The Air Navigation Company, Ltd.

Mr. Norbert Chereau.

To find a small Surrey village possessed of a Chamber of Trade is an idea which, 20 years ago, would have been regarded as a joke, yet Addlestone has such, and I am sure that in the present day no one regards it as humorous. Although I have not verified the facts, I suspect that the Aircraft Industry was not without its influence when the Chamber was formed. Twenty years ago the Air Navigation Company would also have come in for its share of ridicule from the tongues of sceptics, and I should have been glad to have some of them with me when I sat listening to Mr. Norbert Chereau speaking of the future of the aeroplane in commerce. What a sentence it would be for the guilty. I sat there hearing plans for the linking of London, Paris and Milan (as it is probably known the firm has a sister company in each of these foreign cities), and it is meditating running its own machines for passenger and other work. The uncertainty as to the official restrictions which may be imposed is responsible for the tentative character of the policy at the present time; but the plan is there all the same.

Mr. Chereau could not give me particulars of types of machines to be used, again because the official dictum is awaited. It seems probable, however, that seaplanes will form part of their "flying stock," as M. Blériot has prepared for their manufacture by purchasing a large building site. In connection with Aerial Transport Mr. Chereau is one of the believers in "main lines" of large machines fed by local services of smaller types.

The Future of the Large Machine.

I asked him what he thought the future of the large machine would be. He replied that in his view we should get something very different from any existing design, of course, retaining the aerofoil, and with a very low landing speed, as a matter of fact 10 miles an hour was mentioned. He does not foreshadow the helicopter, but he rather gave me the impression of foreseeing that some radical change from our existing ideas of construction would take place. Holding the opinion that the very large machine will be so elastic in performance he tells me that he does not consider that the airship will be necessary, in fact, that it will be supplanted by the aeroplane. Here is an exponent of the great machine with a vengeance. On the question of the small privately owned aero or seaplane, Mr. Chereau thinks that the market will be very limited, owing not only to the cost of upkeep, but because of the expense of either owning private landing grounds, or, in lieu of that, high aerodrome charges for garaging the machine, and, again, in fees payable when cross-country journey is made. I suggested to him that it would be no more expensive than yacht-owning, but I do not know whether that will have to any extent caused modification of his opinion.

The Life of Aeroplanes.

As to life of a machine Mr. Chereau points out that with the much lower grade timber supplied nowadays it is very difficult to judge. He quoted a pre-war machine which was perfectly sound after three years' use, and said that the same engine remained in the machine at the conclusion of that period. As both engine and machine were made of pre-war material they could hardly be taken as a standard on which to base calculations as to life of machines made from elements that are at present available. While on this topic, Mr. Chereau said that he was in favour of the builder's mechanics being called in to effect repairs, and mentioned two instances to prove the desirability of this procedure. In the second case, where local aid had been sought, disaster followed, and so also in due course did the firm's mobile mechanical party. I gather that this party will be brought into existence again with the commencement of civil flying. I asked Mr. Chereau whether he considered it might not pay to sell aeroplanes on the principle adopted by some motor-car firms, that is, that the firm should maintain the machine for a fixed yearly payment, but he considered that the variable nature of the expenses connected with aeroplanes made this out of the question, and that a better method would be to agree to carry out all repairs at the cost of the men's time only.

A ceiling of 12,000 feet he considered to be sufficient for commercial machines.

The Pilot of Commerce.

Referring to the pilot, Mr. Chereau is of the opinion that he will always be of importance. He said that that was bound to be the case where judgment is required. It has remained so in ships, and the motor-driver without judgment invariably has a smash if he goes on driving long enough. That with all the use and improvement in cars nothing had been invented to take the place of judgment; and that it would remain essential to aeroplane pilots, and he did not believe that any mechanical driver would overcome the need for it.

Material.

On the question of material for construction, Mr. Chereau is a believer in wood, at any rate so far as present-day materials are concerned. Of course, there is always the possibility of a new metal or composition being made, but until that happens he thinks that wood is the best thing available.

It is evident from the foregoing that Mr. Chereau is a firm believer in the aeroplane as against the lighter-than-air vehicle. That the firm believes in the commercial possibilities of Aerial Transport is emphasised by the plans for putting it into execution. Gallic imagination placed aviation ahead of us in the early days of flying, and if we are to judge the future by the past, and the insight Mr. Chereau gives that same imagination may well do so in the world of commercial aeronautics of the future.

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This machine is a dual purpose model—it can be employed either as a comfortable four or five seater passenger machine—or its cabin can be denuded of its luxurious internal fittings to provide cargo space for 2,000 lbs. of mail matter or goods.

A series of these machines is in production.

Governments and Air Transit Concerns desirous of acquiring a fleet of this new BAT model on favourable terms are invited to forward their enquiries.

We shall be happy to arrange for demonstration flights at any time for the convenience of serious prospective clients.

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OFFICIAL EXPLANATION OF THE CIVIL AVIATION REGULATIONS

One learns from the daily news-sheets that on April 25th Major-General Sir F. H. Sykes, Controller-General of Civil Aviation, presided at a luncheon given by the Air Ministry at the Criterion Restaurant, on the occasion of the approaching inauguration of civil aviation, for the purpose of explaining to the Press the Air Ministry's policy. THE AEROPLANE was distinguished by being excluded from the gathering.

GENERAL SYKES'S SPEECH.

The following report of the speech of the Controller-General of Civil Aviation is taken with acknowledgments and thanks from the "Times" newspaper:—

General Sir F. H. Sykes said that it was for us to see that we did not during peace lose the advantage gained during war, and that we also held the same position in civil aviation.

The actual regulations, which could not be issued beforehand, would appear on May 1st. At the outset perhaps a word in regard to the absolute necessity for definite regulations might not be amiss. He had alluded to the necessity for being first in the field. This, of course, implied speed, but it did not mean hurry. One could not afford to make mistakes in the air as on the ground, or even as at sea, and a series of accidents which might be caused by lack of forethought and precaution might well cause a setback to the whole art and industry.

INTERNATIONAL REGULATIONS.

Pilots taking passengers for hire must be physically very sound. If the lives of people were to be trusted to pilots for long distances, when the strain was very heavy, there must be a very good measure of medical fitness. Before being put to proof as to their technical capability those wishing to be pilots, navigators, or engineers in the air must pass a medical test. Physical, mental, and temperamental suitability were obviously very important and had been made the subject of special medical research. Any person wishing to fly aircraft carrying either passengers or goods for hire must obtain a certificate to the effect that he was properly qualified to do so, and a licence.

SAFEGUARDING THE PUBLIC.

A man who flew for hire must have skill. An airman might break his own neck, but the public must be safeguarded. The bulk of other countries would require every person who flew a machine in the air to get a State certificate of competence and a State licence. In this country it had been sought to get the greatest elasticity possible and to impose the full obligations only upon pilots who plied with machines for hire or reward. It had to be borne in mind that a man who was flying a machine might fall upon another person's house. On the other hand, the subject had been considered carefully, and it was desired in compliance with the wish existing in the country to assist the sporting element to get its chance. A man flying his own machine would need a licence, but he would not be subject to the same restrictions as a man taking the responsibility of flying for the public.

Turning from personnel to material, every aircraft must be registered and would be assigned a registration and nationality mark. Before this, however, each particular type of aircraft would have to be officially inspected for design, material, construction, and actual performance in the air. Machines would be certified for a definite load, for in the air no over-loading or strap-hanging could be allowed. Each passenger or goods machine would carry log-books. Machines would be tested as types. When the type had been tested it was considered that machines following that type, provided the inspectors in the factories were doing their work properly, need only be subject to very much modified restrictions. The initial machine would be very carefully scrutinised in detail, but afterwards the restrictions would be easier. All passenger aircraft would be periodically inspected, overhauled, and certified as airworthy, and none would be allowed to start on any journey unless it had first been inspected on that same day by a competent person other than the pilot.

THE AIR ROUTES.

Referring to the map of air routes, General Sykes said that to say that the Government were opening these routes was perhaps misleading. What they were doing was to say that at various points on these routes there would be facilities for commercial traffic. The purpose was to indicate to the Industry what help was available and then to give play to the good old British principle of letting industry act for itself. At the aerodromes would be offices for issuing information in regard to meteorological conditions. But there was no restrictive intention. A man flying on a commercial line would take his risk himself. He would decide whether in view of the information he should fly on that line.

As to departure and arrival, passenger-carrying aircraft would be allowed to leave the ground or land (except under stress) only at certain aerodromes which had been approved and licensed as being suitable. A list of those already selected had been given in the newspapers that morning. Rules had been agreed to in Paris for the control of aerodrome traffic and would be attached to the regulations, and once a man was in the air a definite international rule of the road must be adhered to. There would be, he hoped, one area for getting up and another for coming down, which would be signalled to the flier, and a neutral zone, it was hoped, so as to avoid congestion. Every possible precaution must be taken against collision. Instant and instinctive decision was essential, and the rules must therefore be perfectly clear and simple. The aerodrome regulations were not severe. Their whole object was to ensure the greatest freedom of traffic both ways, and at the same time ensure the least possible chance of collision. A small but important regulation forbade anything except ballast, that was to say, water or fine sand, to be dropped from aircraft. It must be remembered that even a small and comparatively light object casually thrown overboard by some thoughtless but well-meaning person might cause grievous damage below.

So far as national secrecy was concerned, there were, of course, certain specified prohibited areas of a nature which could readily be imagined or by which no aircraft might fly. When we reached proper days of peace they would probably become very much less.

An obvious point which had not been lost sight of was the danger of certain undesirable gentlemen from overseas being literally dropped from the clouds in this country and the police and other authorities knowing nothing of their advent. The provisions of the Aliens Restrictions Order or the Defence of the Realm Regulations were applicable to persons arriving in this country by air equally with those arriving by sea, except that the place of "approved ports" was taken by that of "appointed aerodromes."

The danger of aerial smuggling, once aviation became free, was a real one, and it was largely with this in view that there would be at present only four of these "appointed aerodromes" which might be used by aircraft arriving from or departing for abroad. If, however, they found that commercial traffic developed, for instance, from Manchester or Liverpool to France, or, say, Italy, or even further afield, they could always extend the number by arrangement with the Customs.

"SAFETY FIRST."

In regard to the recent foretaste of civil flying provided for in flips, or short pleasure trips, during Easter, he gathered that there had been some dissatisfaction as to the facilities granted by the Air Ministry. It had even been said, he believed, that the facilities were in fact nothing but restrictions. In order to emphasise how necessary some of the restrictions were, he would like to mention a few of the causes which might have given rise to serious accidents during Easter Week if no limitations had been imposed and no precautions taken. As it was, the five days' flying passed without accident, and 972 people were carried safely. This, he thought, reflected credit not only on the firms and pilots concerned, but also on the Department which he controlled, and which, acting on "safety first," had insisted on enforcing, despite some opposition, the regulations which were imposed.

So soon as the announcement that civilian flying was permitted from April 17th to 22nd was made in the House of Commons by General Seely on April 14th, applications were sent in to the Air Ministry from all parts of the country for licensing of proposed sites for aerodromes, machines, and pilots. The majority of the proposed sites had up to then never been used as aerodromes, but in every case officers were ordered by telegram to proceed to inspect them, and many of the places were found to be absolutely unsuitable. Furthermore, some of the pilots who applied for licences were found on investigation to have retired from the R.A.F. as "permanently unfit for pilot or observer." Had permission been granted to these men to take passengers into the air accidents might have occurred with most disastrous results. Again, in some cases licences were asked for machines which were either obsolete or had not passed their experimental stage.

The task of the Department of Civil Aviation would be to help in every way by the provision and Aviation would be to help in every way by the provision and dissemination of intelligence, and information and expert opinion. If, as we were doing, and he was sure we should do, we displayed real team work in its best sense, he had no doubt of the continued success of British aviation.

Replying to questions, General Sykes said some of the aerodromes which had grown up during the war had been handed back to agriculture. It might be better from an international point of view that others should be taken by engineering industries, motor industries, or used for other activities, or it might be that they would be taken up by big aviation firms. He thought the Government would probably maintain some for civil flying. Certainly at present they would. A certain number would be made available for storage. For the time being certain of the aerodromes would really be Government aerodromes as a form of direct assistance for the industry. A fee would be charged for landing to machines passing through. The fee would be what he would consider a nominal one.

Asked how aviation was going to "make its living," General Sir F. Sykes said England was small from an aviation point of view, foggy, and thickly populated. But aviation was going to be international, and it was this which would make civil aviation what it would be. Local aviation would be a link in the chain. Joy-riding would be helpful. It would lead to greater knowledge and greater interest in aviation as a whole. In peace flying increased effort would be put into ground organisation, relating to signals, meteorological information, and other matters.

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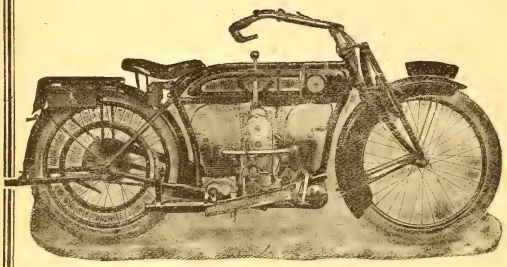
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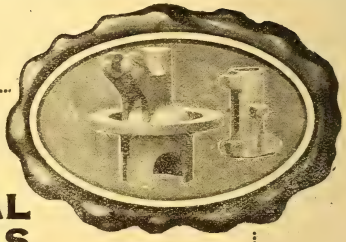
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CAPITALISATION PECULIARITIES.

Some people maintain that it is just as well to be out of the world as out of the fashion. In dealing with certain peculiarities of the capitalisation of aircraft undertakings one must therefore make some allowance for the belief that such peculiarities are simply *á la mode*.

Admittedly the peculiarities are affected by a certain limited, second-rate section of the company world. But to say that the peculiarities represent the best fashion would be untruthful.

Not Liked.

These peculiarities may, in the course of time, develop into a fault or prove a disadvantage. At the moment they are "not liked in the best houses," and therefore detract from the merit of aircraft investments just at a time of uncertainty and suspicion, when every little that is good is really good and helpful and every little that is bad is very bad and menacing.

Inequitable Division.

Why should the capitalisation be divided into, say, 40 per cent. of Cumulative Preference shares bearing a fixed and maximum dividend, say, 50 per cent. of something euphemistically described as Participating Preference shares entitled to a minimum rate of dividend supplemented by a moderate division of surplus profits, if any, and the remainder of the capital in Deferred shares?

Faulty Principle.

One is not provoked to criticise this peculiarity *per se*, or even because of the confusion created by the classification of the shares, but because of the principle involved, and rather on moral grounds, with some regard for the future of the Industry. In the division of the financial responsibility the burden is not equitably balanced: those who have staked little stand to scoop in the lion's share of whatever profits there may be to distribute. These so-called Deferred shares are really Founder's shares, and Founder's shares went out of fashion ages ago: they were in fact forced out of fashion by the abuses they created.

Experience not Satisfactory.

Nowadays the investing public is much more enlightened: as a rule, it abhors Founder's shares or shares any way approaching that character, and this dislike is really fundamentally sound. Doubtless it is socialistic in a way, being an objection to any special privileged group receiving a greater proportion of the profit than is represented by the capital at stake. This is simply common sense.

Two Points of View.

Those whose genius or ability enable them to develop a commercial project are justly entitled to a correspondingly large remuneration. No one can conscientiously dispute their claim. But the investor who risks his capital for the purpose of enabling the guiding genius to translate his ideas into a profitable business is also entitled to a rate of remuneration commensurate with the great risk entailed. This, too, is indisputable.

Founder Shares Disabilities.

Furthermore, the investor who risks his money for the commercial exploitation of new ideas, like aircraft, frequently pins a great deal of faith in the chance of a brilliant financial success ultimately when his initial courage will be richly rewarded. But the common experience of successful undertakings burdened with Founder's shares is that the ultimate reward of the investor is beggarly and almost insignificant compared with that received by the holders of Founder's shares.

Trouble Results from Success.

Founder's shares possess a menacing degree of power, and their possibilities, assuming success is attained, are so unrestricted, compared with the capital originally staked, that they become troublesome to the company: they even retard progress and development at times, and that is why the necessity arises for capital reorganisation. Such reorganisation means the purchase at a fantastically high price of the vested interests created by the existence of the Founder's shares.

If There is a Failure.

It is thus quite easy to understand why promoters are partial to Founder's shares: they risk little capital, and so if the worst comes to the worst and their ideas do not prove commercially successful their pecuniary loss is small. In such an event the loss to the ordinary investor is considerable, and it is then that bad words are coined to describe the pernicious nature of Founder's shares.

Mistaken Idea of Fashion.

This mixed variety of capitalisation characteristic of aircraft companies is not fashionable, and is not liked as a rule. It would be far better if the capitalisation conformed with the ordinary practice. In the case of, say, a £500,000 company, there might be £200,000 in Cumulative Preference shares. This type appeals to a large number of people whose first consideration is a decent uniform rate of interest compatible with a moderate risk.

Straight Financing.

The balance of the capital should be in Ordinary shares. Some of these would be reserved in part payment of the purchase consideration and allotted to the promoters. The balance would appeal to that speculative section of the public fond of new ideas and not frightened by such a risk as that involved.

Not only would capitalisation on these lines be more sound: it would be cleaner. The promoter, in the event of success, would be amply rewarded for his genius and ability. It would be fairer to all parties.—W. J. Davies.

CURRENT TOPICS.

Sustained Activity of Oil Shares.

Conditions are moderately cheerful in the financial world. Quite a lot of speculative activity is witnessed in the Stock Exchange, being centred principally in oil shares and a few isolated mining descriptions. It is remarkable how consistently good oil shares are maintained, being capable of rising superior to such adverse influences as the Budget, and being only temporarily affected by diplomatic difficulties such as those with Italy. The Budget is feared by most people, and serves to check any latent confidence in purely investment securities. Even if the worst happens, there will be a sigh of relief, because there is no greater enemy to finance than uncertainty.

Dealing in New Handley Page.

A few dealings have taken place in the new shares of the Handley Page Co. at a small discount. Doubtless a real market will be maintained in these shares. This is as it should be, and is in the interests of all.

Aircraft Manufacturing issues have sunk to a slightly lower level, the "B" being slightly under £1 and the First Preference about that figure. Some investors are growing nervous about the immediate prospects. The 7 per cent. Short Term Notes have changed hands about 102¾. Aero Stations, Ltd., announce a dividend of 10 per cent. on the year's trading. This company dates back to 1917, and entered into an agreement with the Brighton Shoreham Aerodrome, Ltd., to acquire and develop stations for aircraft and to carry on other work.

NEW COMPANIES.

J. F. & R. Platt, Ltd.—Private company. Registered April 12th. Capital, £10,000 in £1 shares. Mechanical, electrical, marine, aircraft, consulting and general engineers, in the U.K., the U.S.A., Europe, and elsewhere. The subscribers (each with 50 shares) are F. J. Platt, Dudbridge Hill, Stroud; R. E. Platt, Junior United Service Club, S.W. First directors: J. Platt, F. J. Platt, and R. E. Platt. Solicitors: Denton, Hall, and Burgin, Gray's Inn, W.C.1.

Associated Aircrafts, Ltd.—Private company. Registered April 17th. Capital, £100 in £1 shares. Designers and manufacturers of aircraft, cabinet work, and machinery, etc. The subscribers (each with one share) are R. Taylor, 26, St. Mary's Mansions, Paddington, W.2, engineer; C. Nathan, 97, New Bond Street, W.1, secretary. The first directors are to be appointed by the subscribers. Registered office: 97, New Bond Street, W.1.

North Sea Aerial Navigation Company, Ltd.—Private company. Registered April 23rd. Capital, £10,000 in £1 shares. To carry on the business of civil aerial trading, transport, and navigation, aircraft designing and construction, motor manufacturing, flying instruction, etc. The first directors are R. Blackburn, Bowcliffe, Boston Spa, Yorks, managing director of Blackburn Aeroplane and Motor Company, Ltd., and S. A. Hirst, Oak Lea, Adel, Leeds, commercial engineer. Registered office: Olympia, Roundhay Road, Leeds.

Aeronautical and Panel Plywood Company, Ltd.—Private company. Registered April 24th. Capital, £100,000 in £1 shares (25,000 preference). To take over the business of timber and plywood merchants and sawmillers recently carried on by W. M. Mallinson and Sons, Ltd., at 218-226, Kingsland Road, and 5-7, Laburnum Street, E.2. The first directors are W. Mallinson, The Limes, Walthamstow, timber merchant (chairman); W. J. Mallinson, The Grange, Carshalton, Surrey, timber merchant; L. V. Mallinson, The Limes, Walthamstow, timber merchant. Registered office: 218-226, Kingsland Road, E.2.

Boulton Magnetos, Ltd.—Private company. Registered April 15th. Capital, £4,000 in £1 shares. To take over the business of magneto manufacturers carried on by A. H. and J. H. Boulton, as "A. H. Boulton and Sons," at Old Hall Street, Wolverhampton. The subscribers (each with one share) are:—P. Thomas, York Avenue, Wolverhampton, brassfounder; A. H. Boulton, 146, Waterloo Road, Wolverhampton, magneto manufacturer. First directors: A. H. Boulton, P. Thomas and C. W. Parkes, Church Hall, Tottenhall. Solicitor: A. C. Skidmore, Imperial Chambers, Lichfield Street, Wolverhampton.

British Motor Trading Corporation, Ltd.—Registered April 17th. Capital, £2,000,000 in £1 shares. Manufacturers, repairers and storers of and dealers in motor vehicles, tramcars, locomotives, cycles, boats, aircraft and agricultural tractors, and appliances, garage and aerodrome proprietors, owners of motor, electric and other boats and vehicles, etc. First directors: C. H. Dodd, Arkley, Holyport, Berks., solicitor; Brig.-Gen. F. Conway Jenkins, C.B.E., R.A.F., 25, Jermyn Street, S.W.; J. E. Hodgkin, Shelleys, Donington, consulting engineer; W. R. Jeffreys, Brecon, Christchurch Park, Sutton, Surrey, director Motor Union Insurance Co., Ltd; H. J. Whitcomb, Campions, Harlow, Essex, general manager Motor Union Insurance Co., Ltd. Solicitors: Slaughter and May, 18, Austin Friars, E.C.

Taunton, Lindsay and Co., Ltd.—Private company. Registered, April 16th. Capital, £10,000 in 9,000 10 per cent. participating preference shares of £1 each, and 20,000 deferred shares of 1s. each, to adopt an agreement with J. B. Taunton, of 98, Victoria Street, S.W., and to carry on the business of manufacturers of and dealers in aeroplane engines, aeroplanes, motorcars, etc., Permanent directors: J. B. Taunton, 22, Marloes Road, W.8, engineer; Capt. J. M. Lindsay, 78, Buckingham Gate, S.W.1.

Affiliated Aero Clubs of the British Empire, Ltd.—Private. Registered April 15th. Capital £100 in £1 shares. To acquire sites for the construction of club houses and landing grounds for the use of aviators and others, and to carry on the business of club and aerodrome proprietors, merchants, agents, engineers, carriers, etc. The subscribers (each with one share) are:—G. A. Wingfield, 74, Cheapside, E.C., solicitor; H. Wingfield, 67, Watling Street, E.C., C.A. The first directors are not named, the company being governed mainly by Table "A" of the Companies (Consolidation) Act, 1908. No notice of situation of registered office was filed at the time of incorporation.

The following companies have been registered for purpose of acquiring from Aero Stations, Ltd., sites adjoining the places named in the titles. The other objects and general particulars are similar to those of Affiliated Aero Clubs of the British Empire, Ltd.

Aberdeen Aero Club, Ltd.; Birmingham Aero Club, Ltd.; Bristol Aero Club, Ltd.; Carlisle Aero Club, Ltd.; Derby Aero Club, Ltd.; Dundee Aero Club, Ltd.; Edinburgh Aero Club, Ltd.; Exeter Aero Club, Ltd.; Folkestone Aero Club, Ltd.; Glasgow Aero Club, Ltd.; Grimsby Aero Club, Ltd.; Inverness Aero Club, Ltd.; Ipswich Aero Club, Ltd.; Leeds Aero Club, Ltd.; Liverpool Aero Club, Ltd.; Manchester Aero Club, Ltd.; Newcastle Aero Club, Ltd.; Norwich Aero Club, Ltd.; Plymouth Aero Club, Ltd.

MORTGAGES, CHARGES, AND SATISFACTIONS.

R. L. Dubois and Co., Ltd.—Debenture dated March 20th, 1919, to secure £430, charged on the company's undertaking and property, present and future, including uncalled capital and book debt of Meerloo Engineering Company, Ltd. Holders: L. Schaer.

John Dawson and Co. (Newcastle-on-Tyne), Ltd.—Debenture dated April 4th, 1919, to secure £30,000 and any further sums (not exceeding £70,000 altogether), charged on the company's undertaking and property, present and future, including uncalled capital. Holder: Minister of Munitions.

PROSPECTS OF ALUMINIUM.

Concerning the prospects of the aluminium industry the following statement by a leading authority is interesting:—Although the present conditions are difficult it is clear that if industry can resume its normal proportions it will not be long before we see improvement, because the developments which took place in the demand and uses for the metal previous to the war were of a most encouraging nature, and much progress has been made since in consequence of the war.

Therefore, although to-day there is manifestly a large surplus capacity of production throughout the world it is to be hoped that within a reasonable period this will not only be taken up, but it will again be necessary still further to increase production in order to supply the demand.

The future for the metal is bright when we consider the large demands which must in time be made in consequence of the development in the motor, chemical, electrical and aeroplane industries, and for domestic utensils and other commodities for which it is eminently suited in addition to the demands which have been, and will be, created, by research work in connection with alloys in which aluminium plays an important part. The costs of production during the past year have shown substantial increases over those of the previous year, but this was to be expected because of the increases in wages (which have had to be granted from time to time to meet the increased cost of living) and in the costs of all materials.

SURPLUS AIRCRAFT STORES.

The Surplus Government Property Disposal Board, Aircraft Equipment Section, has to dispose of a large quantity of items that should be useful to aircraft manufacturers. The following are examples:—

Bolts and nuts, 2 Ba, 4 Ba, 6 Ba—¼, 3/16, ⅜ B.S.F.; metric, ditto; strainers for brake controls; wire cables; woodscrews, brass and iron; studs, various; union connections, brass; relief valves; petrol filters; copper tubing; steel tubing; washers, all metals; rivets, all metals; joint fins; fork joints, steel; petrol tank fittings; Bowden controls and wires; brass cocks; hose pipe connections and clips; gimp, fine, for trimmings; accumulators; aluminium beadings, sheets, angles, etc.; duralumin ditto; brass ditto; celluloid sheets for windows; acetylene lamps; electric switches; speaking tubes.

The address of the S.G.P.D.B. is 54L, Alexandra House, Kingsway, W.C.2.

PETROL SUPPLIES.

It is stated by the Petroleum Executive that the impression which appears to prevail in some quarters that there is a serious scarcity of petrol is quite unfounded, as there are abundant supplies in this country available for all purposes. It may be mentioned that the price has been reduced by 5½d. per gallon since the date of the Armistice. The control system is not being continued in order to restrict supplies, but for the purpose of collecting the license duty, the present arrangements for which must remain in force until the question can be dealt with in the new Budget.

By Direction of the Disposal Board.

AIRCRAFT DISPOSAL DEPARTMENT.

FOR SALE

AEROPLANE RADIATORS.

Lot S.B.6/12.

500 Aeroplane Radiators, some new, others repairable, material, chiefly Brass.

AEROPLANE RADIATOR TUBES.

TONS.	BRASS NEW.	
32	120m/m × 10m/m × .005	Air Board Standard.
19	100m/m × 7m/m × .005	
3	100m/m × 10m/m × .005	

SHOCK ABSORBER CORD.

Lot S.B.6/12.

NEW.

510 yds.	Black Braided Shock Absorber Cord	$\frac{3}{32}$
190	,, ,, ,, ,,	$\frac{7}{16}$
1651	,, ,, ,, ,,	$\frac{5}{8}$
2718	,, ,, ,, ,,	$\frac{1}{2}$
1297	,, ,, ,, ,,	$\frac{3}{4}$
537	,, White ,, ,, ,,	$\frac{5}{8}$

Passed by A.I.D.

PALMER WHEELS COMPLETE.

Lot S.B.6/12.

63 Palmer Wheels, complete with tyres and tubes, size 100×150. Passed by A.I.D.

FLEXIBLE TUBING.

Lot S.B.6/12.

New Oil and Petrol-proof Tubing, Canvas and Rubber.

3-ply 157 feet, various lengths and sizes.
2-ply 1545 feet, ,, ,, ,,

SEAPLANE PARTS.

Lot S.B.5/11.

A quantity of finished and unfinished Seaplane Parts now lying at the Works of Messrs. J. Samuel White & Co., Ltd., Isle of Wight. To be sold in one lot. The above may be viewed on the following days :—**Thursday, Friday and Saturday, May 8th, 9th and 10th.** Forms of Tender and further particulars may be obtained from the :

AIRCRAFT DISPOSAL DEPARTMENT,
YORK HOUSE,
KINGSWAY, W.C.

Latest date for receiving Tenders is May 12th, 1919.

MR. SANDOW
ON
Natural & Scientific Nerve-Culture.

THE PHYSICAL BASIS OF STRONG NERVES AND A COOL BRAIN.

The nerves are the strands in the life-line of an airman. What is the secret of strong nerves? What is it that gives a man that sublime calm and confidence in the critical moment—I might even say second—that may decide not only his own fate, but the fate of others dependent upon him? It is not, as some may think, a supernatural gift. The superman in the air, with nerves like finest-tempered steel, is only a superman in physical condition, and that superior physical condition is, I contend, attainable by all, naturally, easily, and pleasantly.

Nerve strength is not to be found in any special food or drink, or medicine, and nervous force can only be generated in the body by the perfect functioning of every other organ, more especially of the organs of respiration, digestion, and elimination. In other words, physical fitness and efficiency are the basic essentials of strong and steady nerves. The three requisites of a well-ordered nervous system are :—

1. Pure air. 2. Good food. 3. Physical exercise.

The two first are ensured, but they cannot be converted into nervous force in sufficient quantity or quality without the latter, and in no other branch of military service is this vital factor so apt to be overlooked. Indeed, I know one leading airman, a pupil of mine, who has been flying for three years, and who has never had an accident in the air, and he attributes his nerve entirely to my system of keeping himself always thoroughly fit, as many airmen who have consulted me declare that they get less physical exercise than any other fighting men, and their nerves suffer in consequence.

"A course of Sandow," as it is colloquially called, is the best tonic an airman can have, as many flying men gladly testify. It means :—

1. Firm muscles—and muscle is only "crystallised function."
2. Sound digestion and a well-nourished nervous system.
3. Deeper and fuller breathing and nerves well nourished.
4. Well-oxygenated blood and good circulation.
5. A body, brain, and nervous system harmoniously developed, strengthened, and self-disciplined.

The nervous system is the petrol tank of the human engine, the driving power of the whole human machinery.

Every other system is dependent upon and regulated by nerve force. Airmen, therefore, will appreciate what I mean when I say that the storage of nerve force is the most vital necessity of the human body in every condition and circumstance of life, but especially in the peculiar and abnormal condition by which they are almost daily subjected.

Airmen anxious to get and keep "in the pink" should try a "course of Sandow." I shall always be pleased to place my services at their disposal, and they can carry out my advice either by correspondence or at the Sandow Institute. Only a few minutes daily will suffice to recruit their nervous force and condition, and the exercises are always most carefully chosen to suit the individual in every way. They are easy and pleasant to carry out, and increase nerve force in *the only and natural, safe and radical way*. Personal consultations by appointment or free descriptive booklet will be sent on request. Address all letters personally.

COUPON.

Mr. E. Sandow, Sandow's Curative Institute, Ltd., 32, St. James Street, LONDON, S.W.1.

Sir,—Please send free booklet descriptive of your methods as offered.

Name .....

Address .....

.....

Age ..... "Aeroplane," 30/4/19.

AERONAUTICS and The LAW

GREETINGS FROM THE SKY.

By "THE LINCOLN IMP."

The pictorial postcard will soon be reinforced by the products of the aerial camera. The public has plunged up into the air and will soon be exhibiting a longing to tell its friends all about it. "Greetings from the Sky" will come fluttering down, and "Souvenir Pictures" taken on the trip will find a ready sale and be bought for posting to acquaintances in all parts of the world.

Presently will come the desire for a vertical or oblique photograph of the tripper's own home, perhaps even taken by the tripper himself, developed on board, and dropped by him in his own garden! But what if a neighbour, who happened to be taking a siesta in his garden in the sun, objects to a plan view of his bald head being thus published to all the world? Could he claim damages for libel, or could he obtain an injunction to prevent his person or property being photographed against his will or forbidding publication of the prints, or how could he stop it?

The Right to Privacy.

Though the example given is facetious, the principle at stake is a serious one. In certain circumstances it may prove to be of considerable importance to John Citizen on the one hand and to the aerial photographer on the other. Put in a phrase, the question at issue is whether or no the law recognises a specific right to privacy for a fellow's own concerns. Is an Englishman's house his castle in the sense that he can prevent his personal sayings and doings at home from being published abroad and keep private and unexposed to the curiosity of the world the house and grounds, small or large, which he has a right to call his own? Is there any right "not to be overlooked"?

American Law.

Sir Frederick Pollock has pointed out that the Common Law of England is "the system according to which justice is administered in almost every part of the English-speaking world except Scotland and Louisiana." To this generality the United States of America form no exception, and English decisions are constantly accepted by American judges as authorities which they are bound to follow in administering American law.

Though the converse is not true, and American decisions are not authorities which bind an English Court, yet, in the words of Lord Esher, "we are always glad to be able to follow them." It is therefore not irrelevant to examine the American decisions on what a learned American writer has called "the right to be let alone," inasmuch as the point, though fully considered in the States, has never been raised directly in our own Courts.

The Castle in the Air.

In 1890 the "Harvard Law Review" (Vol. IV.) contained a long and learned article in which it was sought to establish that the principle which protects personal writings and other productions of the intellect or of the emotions from piratical publication is not the principle of private *property*, but the right to privacy independently of property.

"The Common Law," say the authors, "secures to each individual the right of determining, ordinarily, to what extent his thoughts, sentiments, and emotions shall be communicated to others, and the law has no new principle to formulate when it extends this protection to the personal appearance, sayings, and acts and to personal relations, domestic or otherwise."

The article seems to have been evoked by a case in which an actress alleged that while acting in Broadway Theatre in a *rôle* which required her appearance in tights a flashlight photograph was taken of her, from one of the boxes, surreptitiously and without her consent, by a photographer and the manager of "The Castle in the Air" company. The article was subsequently quoted with approval and almost made the basis of his decision by an American judge in a rather curious case.

The Typical Philanthropist.

Mrs. George Schuyler, though largely interested in private charities, had never in any way entered public life. On her death some zealots known as the Woman's Memorial Fund Association undertook to commemorate her good deeds by a statue of her to be designated "The Typical Philanthropist" and to be placed in Chicago as a companion piece to a bust of a well-known agitator, Susan B. Anthony, who was to be called "The Typical Reformer." In consequence of the strong disapproval of Mrs. Schuyler's relatives of the proposed commemoration her nephew brought an action to prevent it taking place, and obtained an injunction, the judge expressly basing his decision on the existence of a right to privacy at common law. The lady, he held, could not be forced to become a public character even after her death.

This decision was, however, reversed on appeal on the ground, it would seem, that whatever the lady's own rights might have been in her lifetime, they ceased on her death, and the mere injury to the feelings of her relatives gave them no claim to relief in a court of law. A critic of this decision somewhat unkindly inquired: "Could the learned judge bear for an instant the thought of a public representation or description of his courtship after his death?"

My Face is Your Fortune.

Similar ill-success attended attempts (1) to prevent publication of a biography with portrait of a well-known inventor after his death, and (2) to prevent a cigar manufacturer from using the name and likeness of a dead man as a label for a brand of cigars. More striking still was a case where the plaintiff—described as a young woman of attractive appearance—was herself refused an injunction to prohibit the unauthorised use of her own portrait by a company in advertising its business.

Hunnish.

In 1894 the editor of "Der Wachter" started to publish portraits of a law student, formerly an actor, and also of an actor called "Mogulesko," and invited his readers to vote which of them was more popular. The judge considered the law student's right to stop this "too clear for further argument" and granted an injunction.

Lack of Privacy in the U.S.A.

The net result of the American cases is that the Courts, after showing a marked tendency at one time to decide in favour of the existence of a specific right to privacy at common law, finally decided against it, through fear, very largely, of frivolous actions.

English Analogies.

In England, as we have said, the suggested "right to be let alone" seems never to have been seriously raised in any of the reported cases. Analogous actions have all, with greater or less ease, been brought under one or other of the subordinate heads of law known as libel and slander, copyright, breach of contract, or abuse of confidence. Considerable difficulty, however, exists in bringing under any of these heads the mere publication to the world of what is visible or can be photographed from the air.

Queen Victoria's Etchings.

The case of Prince Albert v. Strange is remarkable from many points of view. As stated by Knight Bruce, K.C., the facts were that "a lady and gentleman (the latter being the plaintiff) having, with a view no doubt to rational and domestic amusement, learned the art of etching, executed from time to time for their private use several works of this description."

The "lady and gentleman" were in fact Queen Victoria and the Prince Consort, the latter of whom brought the action, while the Queen's interest in the matter was protected by her Attorney-General in her own Courts.

A complication arose from the fact that some of the compositions in dispute had been drawn by the Queen and etched by the Prince and some *vice versa*; but the Prince was expressly prohibited by statute from acquiring any interest in the property of Her Majesty his Consort, while there was a legal difficulty about the Queen taking an oath or giving evidence before a Court over which she as Sovereign was supreme, "in all courts and over all causes as well ecclesiastical as civil within Her Dominions Supreme," as the bidding prayer has it.

For present purposes, however, we may disregard the hairy exterior and come straight at the milk in the cocoanut—to wit, the simple facts that the unpublished etchings of the lady and gentleman had been seen by the defendant, who had described and catalogued a number of them and was proposing to publish and sell this descriptive catalogue. To any such publication of their private efforts the lady and gentleman strenuously objected.

Having cracked the legal nut the Courts came at the milk and granted the plaintiff an injunction on the ground (a) that unpublished works are the property of the author, who can prevent even a list of them from being published, and (b) that the information contained in the list could only have been procured by means of a breach of confidence on the part of someone.

This case is the high-water mark of the law on this subject, but unless my person and private property can be described as

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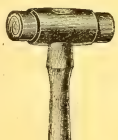
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" my unpublished works " it is difficult to see how a photograph of either taken from the air without my permission could be brought within the *ratio decidendi* of the case. " I light my torch by your torch, you are none the poorer," unless, as was maintained in argument, " there has been the abstraction of one attribute of property which is often its most valuable quality—namely, privacy." But could one prevent a man from looking over his own wall and watching the performance of his neighbour's racehorses and publishing an account of what he saw? Surely not, or this would have been the ground of the decision in the racing tout case mentioned in a previous article.

The Chamber of Horrors.

We are told by Mr. J. T. Tussaud that the idea of a separate " chamber of horrors " originated with a Cambridge professor. It was an excellent idea, but the place is not a nice one in which to spend the night even if you are only a wax figure. Mr. Monson had had the misfortune to be tried for murder in Scotland, the trial resulting in the Scotch verdict of " Not proven." He objected very strongly to a wax portrait model of himself being placed in or near the Chamber of Horrors at Madame Tussaud's and brought an action to stop it.

He did not contend that the figure was not a good likeness nor did he claim any copyright in his own face or appearance. He put his claim substantially on the ground that placing him in that situation held him up to public opprobrium, not necessarily as a murderer, but as a notorious character, and he secured on that ground a temporary injunction. The injunction, however, was not continued by the Court of Appeal because of new evidence to the effect that the plaintiff had himself supplied for exhibition, through a friend, the gun he was carrying and the suit of clothes he was wearing on the day of the supposed murder!

Pertinent Questions.

Lord Halsbury said he regarded " with something like dismay" the claim that "every incident which has actually happened in private life may be used to furnish materials for an adventurous exhibition, dramatised perhaps, and justified because, in truth, such an incident did really happen "; but Lord Justice Lopes asked : " Might not a jury, without being unreasonable, consider that any discredit attaching to Monson resulted from the trial and not the exhibition of his figure at Madame Tussaud's? " None of the judges in their judgments gave support to the existence of any general right to privacy. Collins, J., asked : " Has it ever been held that a private individual can restrain the publication of his own face? " Mathew, J., replied : " If it were so, no paper could publish the likeness of a person without paying him a royalty."

This point was neatly raised and disposed of in a case where a photographer displayed for sale in his window a print made up as a Christmas card and taken from the negative of a photograph of a lady taken in the usual way. An injunction was granted, not on the ground that the lady could restrain publication of her own face, but on the ground that it was an implied term of the contract she had made with the photographer when she gave him the sitting that the negative should not be used by him for such a purpose as this, and that so to use it was a breach of confidence on his part. The case of a snapshot taken without permission would be quite different.

Conclusion.

It appears, therefore, that the taking of aerial photographs and their reproduction for gain is a legitimate enterprise open to all the world as soon as flying becomes general, and that it cannot be objected to as an infringement of " the right to be let alone " because no such right as this is known to the law.

AIR FORCE LAW.

"*Some* sort of order, please, Mr. Jones," a Judge of the High Court is recorded to have begged of Counsel who was rambling at large through a maze of facts, figures, and dates, "*alphabetical* order if you like, but chronological is best."

Some sort of order is an urgent requirement if that welter of words which constitute Air Force Law is to be read with any sort of profit, let alone pleasure.

Mr. Cheshire (who concurs with the Judge in finding chronological order best) has carried out excellently* the burdensome task of re-stating in logical order and sequence that portion of K.R. and the Provisional Manual of Air Force Law which deals with the investigation of charges and the preparation of a case for Court Martial.

A Well-Defined Plan.

The subject is considered under six heads, which follow exactly the usual sequence of events; to wit, an arrest followed by a charge investigated first by the Squadron Commander, and then by the C.O., and finally, if necessary, by a Court Martial, for which the case has to be prepared.

The plan of the booklet is this: In the text will be found a clear statement of the normal and proper procedure at each stage of events, whilst in the wide margin there is inserted, in clear and distinctive type, the number of that section or paragraph of the Act or the Regulations which is quoted as an authority for the statements made in the text.

The advantage of this plan is that it enables the pamphlet to fulfil a double function. The text is a clear and readable summary of the law, and the margin contains a handy and complete index to the relevant portions of the Air Force Act and Regulations.

The Meaning of Crime.

"Crime 'im," says the traditional drill-sergeant at every petty offence, but this does not justify Mr. Cheshire in asserting that "Crime" is a term which "ranges from the most trivial peccadillo of military life, such as slovenliness in one's dress, to those enormous misdeeds which figure in the opening sections of the Air Force Act."

The word " Crime " is one which has given lawyers a lot of trouble to define, but whatever its content may be it is not synonymous with " Offence," which is a term borrowed from Military Law, and largely, if not exclusively, employed throughout the Air Force Act and the Rules. This detail, however, is of no great importance.

Another detail worth pointing out is that the term "Airman," which Mr. Cheshire uses, should no longer be employed. " Men in the Ranks " at present are "Aircraftmen"; the declension of the term being apparently "Leading Aircraftman," "Aircraftmen First Class," "Aircraftman Second Class," and, finally, "Boy." But to keep up to date with Air Force Uniform and Terminology the reader must be a close student of Weekly and other Orders.

Specimens of Documents.

The point might prove of importance in drafting a Charge or Summary of Evidence. Specimens of these and similar documents are given in the pamphlet, and appropriate references are made to the official Air Force forms throughout.

Throughout the pamphlet due emphasis is laid on practical points; for example, the important distinctions which exist between such terms as "Reprimand" and "Severe Reprimand" and " Disobeying a Lawful Command," and " Hesitating to Obey an Order." The cases in which forfeiture of pay is inflicted as a punishment are duly differentiated from those cases in which it is automatic.

The Sources of the Law.

The author is to be commended for his candour in warning the reader against placing reliance on the wording of any text book further than as a guide to the sources of the law. The law is to be found in the Act and Regulations not in the text which, however, does serve to elucidate for the reader the crabbed and involved statements therein, and to enable him to find his way through the wilderness of words to the solution of his particular problem.

It is not only those C.Os. and Adjutants who formerly belonged to the R.N.A.S. who will find a use for Mr. Cheshire's little book.

The Lincoln Imp.

* "The Investigation of Charges in the R.A.F." By G. C. Cheshire, M.A.B.C.L. (Published by Gale and Polden, Ltd., at 2s. net.)

AERIAL TRESPASS.

Speaking in the Inner Temple Hall recently on the legal problems of commercial aviation, Lieut.-Col. T. W. C. Carthew, D.S.O., R.A.F., said that, unless the question was approached in a broad-minded way, infinite harm might be done in an epoch-making industry.

It was unthinkable that a nation could surrender the sovereignty of its air-space. Supposing an aeroplane came down in Piccadilly and killed someone, how would they be able to show fault or negligence when the pilot's head might be on the pavement of Piccadilly and his legs on Ludgate Hill? Was there going to be right of action for trespass against every aeroplane that crossed a person's property?

These questions were of great interest to underwriters. Industrial aviation companies could not generally be their own insurers, and if third party risks were very heavy Lloyd's would not undertake them. He suggested that a practical solution of this difficulty might be found by charging 6d. or 1s. a flight, and thus forming an indemnity fund under the control of the Civil Air Ministry, which could meet liabilities above a certain amount. By limiting the loss on one particular machine aviation could be assisted as a commercial proposition.

The gruesome suggestion regarding the imaginary pilot whose legs were on Ludgate Hill and his head in Piccadilly is not quite clear. If the machine fell in Piccadilly, why should the pilot have left his legs on Ludgate Hill? In spite of Lieut.-Col. Carthew's comment, one thinks such a performance would prove negligence.

CIVIL AVIATION AND THE AIR ROUTES OF GREAT BRITAIN.

The Air Ministry makes the following announcement:—

As was announced by the Under Secretary of State for Air in the House of Commons on April 14th, the ban on Civil Aviation is to be raised on May 1st, and the Order containing the various regulations which will control it will be signed on that date. There must ensue a period during which regulations are being studied and applications are being made by firms and private individuals for the licensing of pilots and aerodromes and the licensing and registration of aircraft.

To give all the assistance possible beforehand to those intending to take advantage of whatever facilities are offered by the Government, certain details of some of the aerial routes of Great Britain which it is proposed to declare open to civil aviation are now made public. These routes are shown on the attached map. It must, however, be emphasised that they are provisional, for practical experience alone can show if all the air stations selected are rightly placed and whether the proposed air track or route does not in some cases lie too far off certain large centres of population and industry. Uncertainty on these points is for the moment unavoidable. Selection and decision has been limited by existing conditions. Certain aerodromes are in being, and in order to start civil flying as soon as possible and also for the sake of economy it is necessary to make use of what already exists. Whatever may eventually be the demand for additional or new aerodromes, it can be ascertained only after trial.

Existing Facilities.

On November 11th, when the Armistice was signed, there were in Great Britain and Ireland 337 aerodromes and landing grounds (a landing ground being, for practical purposes, the same as an aerodrome with less facilities and accommodation). Of these, 116 have already been relinquished for purposes of cultivation, etc., while about 100 will be required for the time being by the Royal Air Force. There remain, therefore, about 120 aerodromes and landing grounds which will ultimately be available for civil aviation. At very many of these there are extensive buildings, and it is possible that with the progress of civil aviation, Town Councils, public bodies, or important commercial firms interested in the subject, may be disposed to avail themselves of the opportunity of acquiring a "going concern" in an aerodrome equipped with ready-made accommodation.

Owing to the necessity for completing running contracts for material, for maintaining the power of remobilisation in case of necessity, and to the sudden cessation of the war wastage of equipment overseas, the demand for storage accommodation in England at the moment is very great. This implies that at many of the aerodromes marked for ultimate disposal the buildings will for some time be largely required for service machines, causing a deficiency in storage facilities which may prevent potential purchasers from taking over the aerodromes. The question of storage accommodation, however, is one of a temporary nature, and as conditions become more normal the situation will become easier owing to military equipment being relegated to military aerodromes. In the meantime a certain easement may be effected by the erection of Bessonneaux and temporary hangars.

Choice of Routes.

In spite of the storage and other difficulties, the Government has decided to open up certain trunk aerial routes at once. These routes have not been laid down arbitrarily—as History relates was done by a certain Tsar of Russia, in the case of a railway—by ruling a line on the map from place to place. They have been chosen with reference to the situation of existing aerodromes and military demands, and in their arrangement an attempt has been made not only to establish direct communication between London and Ireland, and London and the North, etc., but also to cater for some of the larger and more important centres of population which lie along the route.

The routes at present suggested, together with the more important stations ("station" being the term used for an aerodrome or landing place), are:—

(1) London—Scotland.—Hounslow, Wyton, Harlaxton, South Carlton, New Holland, Doncaster, Copmanthorpe, Catterick, Redcar, Newcastle, Turnhouse, Renfrew.

(2) London—Dublin.—Hounslow, Witney, Castle Bromwich, North Shotwick, Baldonnel.

(3) London—Manchester—Belfast.—Hounslow, Hucknall, Didsbury, Scale Hall, Sheffield, Manywell Heights, Luce Bay, Aldergrove.

(4) Continental Route.—Hounslow, Lympne.

(5) Dutch Route.—Hounslow, Hadleigh.

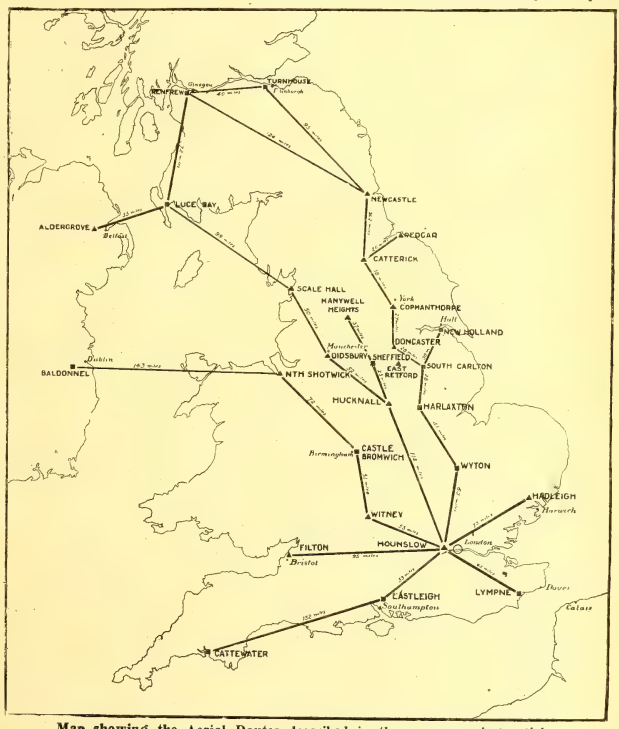
(6) London—Plymouth.—Hounslow, Eastleigh, Cattewater.

(7) London—Bristol.—Hounslow, Filton.

Once a particular route has been declared open, the pilot of an aeroplane making the journey will find petrol, some accommodation, and, where possible, mechanics to handle his machine at each of the air stations named, and the practical value of the intimation now given lies in the fact that on and after May 1st, any individual who complies with the terms of the regulations is at liberty to fly along these civil air routes, and to make use of the stations and facilities afforded. It should be noted by all those interested that the Government cannot guarantee to assist aircraft which may land elsewhere than at a specified station, and a pilot descending either by design or owing to force of circumstances at an aerodrome off the route must not expect to find either mechanics, accommodation or petrol or oil at his disposal.

Opportunities for Private Enterprise.

After deducting from the sum total those aerodromes which have been provisionally selected as stations along the proposed air routes, there will remain for disposal nearly 100, many of which are very well equipped. It is proposed to publish shortly a list of these showing the distance of each from the nearest railway station and postal town. There is, of course, no inherent necessity why these aerodromes, if not required for civil aviation, should not be used for other purposes, and it is possible that not aviation firms alone, but other firms, such as engineering businesses, may desire to seize the opportunity of acquiring large buildings, valuable plant and open spaces of ground situated at important points



Map showing the Aerial Routes described in the accompanying article.

throughout the country. Inquiries on this subject should be addressed to the Secretary, Air Ministry (C.G., C.A.).

Appointed Aerodromes.

The control of traffic passing to and from overseas cannot but prove a difficult problem and it is one upon which the Air Ministry has worked in close touch with the Home Office and His Majesty's Board of Customs and Excise. It has been decided that the aerodromes which can alone be used for this traffic, called "appointed" aerodromes, shall for the present be limited to four in number, and with the exception of the London terminal aerodrome at Hounslow, be on the coast. They are as follows :—

For Continental traffic—Lympne, in Kent.

For Dutch traffic, via Harwich—Hadleigh, in Suffolk.

For Scandinavian traffic, via the Humber—New Holland, in Lincolnshire.

For traffic direct to London—Hounslow, in Middlesex.

At these "appointed" aerodromes all outward and inward bound aircraft must touch, i.e., land for examination of goods and passengers. It has been suggested that these aerodromes would be better situated inland and not on the coast, the argument being that much of the time gained by aerial transit of goods would be lost if examination had to be carried out immediately on crossing the seaboard. But the difficulties of control if such a system were adopted, and the lack of certainty as to what particular channels trade will follow have led to the provisional placing of them on the coast. For the convenience of pilots flying direct from the Continent to London, one "appointed" aerodrome has been placed at Hounslow whence pilots can proceed after examination, direct to their destination.

It should be understood that the "appointed" aerodromes as at present selected are by no means finally fixed as to situation nor limited as to number. If sufficient trade and air traffic should grow up in any other direction, the question will be reconsidered and "appointed" aerodromes will be established by the Air Ministry as necessary at other centres.

Peace and War.

Hitherto, much of the progress in aviation has been due to war and war conditions, and it follows that at first the majority of machines used in civil aviation will be either actual war models or war models adapted. But types more suitable for pleasure and commercial work are already beginning to make their appearance, and for them, as has been the case with the earlier war models, rigid care and supervision in regard to construction and air-worthiness will have to be insisted upon for the safety of the travelling public and also the public which does not travel.

For this duty, the Air Ministry will continue to be responsible. It will not in any way hinder development by imposing inspection on inventions or purely experimental machines, but it will insist on the inspection and certification for general air-worthiness of any passenger machine plying for hire. Not only the machine, but the pilot who carries passengers, and the aerodrome where he lands will be liable to periodical inspection and if they are not passed as fit, the licence is liable to be withdrawn.

Experience gained during the successful short spell of flying during Easter when 972 people were carried has been of assistance in drawing up the Regulations. Any restrictions which have been imposed are for the safeguarding of the public, and it is believed that with the good-will of firms and individuals concerned the restrictions will be of benefit to the development of aviation as a whole.

THE ROTARY CLUB DISCUSSION.

Aeronautics was the subject of discussion at the dinner given by the Rotary Club of London at the Holborn Restaurant on St. George's Day.

The Rotary Club is not concerned with Mono, Clerget or Le Rhône engines, as might be supposed. Neither is it a dancing club for students of the Jazz. It is a sedate organisation of professional and business men who meet at regular intervals to discuss various subjects, chiefly commercial. In its list of members one can find a "Foot Specialist," a Funeral Furnisher, a Milkmonger, a Ventriloquist, a Steam Rolling Contractor and a Physical Culture Expert, to select only a few from a great store.

This fertile intellectual soil produces a wonderful rotation of crops. By conscientious gleaning a member may in time learn all about everything that is not his own business.

On April 23rd, as already stated, the subject of the speeches was Aeronautics, Mr. G. E. Pike, the president, was in the chair, and among those present were Brigadier-General Brooke-Popham, D.S.O., Director of Aeronautical Research, Lieut.-Col. W. A. Bristow, R.A.F., and Lieut.-Col. A. Ogilvie, C.B.E., R.A.F.

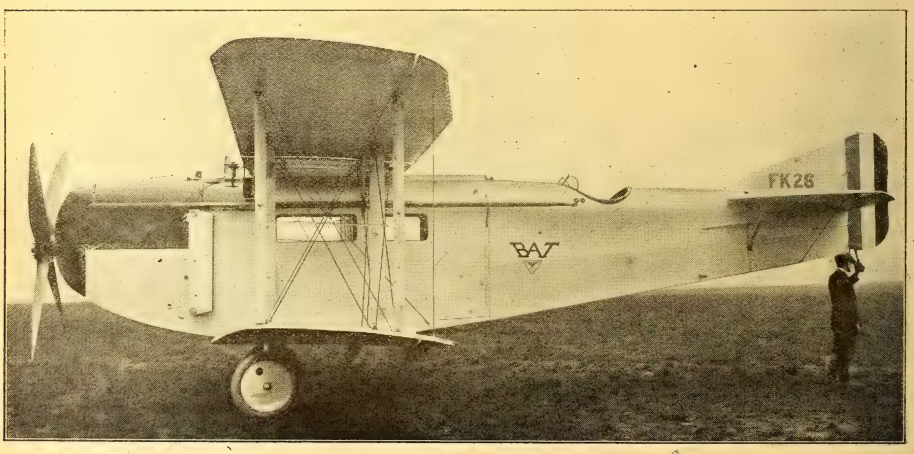
Lieut.-Col. Bristow, in an address, illustrated with lantern slides, gave a historical review of the development of aeronautics.

He remarked that it would be no easy matter to harness for commercial purposes the whole of the great organisations which had been built up during the war, and no doubt before the industry was finally established on a peace basis there might be very considerable changes. He thought it was a great mistake to be pessimistic about the future.

During the war British engineering skill and enterprise overcame far more difficulties in design and equipping war machines than were likely to be encountered in the establishment of successful commercial aircraft. From a practical point of view, therefore, the difficulties might be said to be non-existent, and within a very short time flights of unheard-of range and duration would take place all over the globe.

Commenting on a photograph of the Sopwith machine with which Mr. Hawker hopes to fly the Atlantic, he said some people might think that it was a very small machine for the purpose. The size of the machine, however, had no bearing on the question. If they could find a pilot weighing about one pound he could probably fly across the Atlantic with no more petrol than could be contained in the tank of a motor-car.

Brig.-Gen. Brooke-Popham said that people must not be disappointed if civil aviation did not begin with a tremendous bound. It would probably be a good many months, or even years, before



A REAL COMMERCIAL AEROPLANE.—The five-seater Bat, designed and built by Mr. Frederick Koolhoven, of the British Aerial Transport Co., which is one of Sir Samuel Waring's ventures. It is believed to be the first machine designed entirely for Commercial Aviation, and—*pace* General Brooke-Popham—it already exists, as the photograph shows.

they saw civil machines, designed purely for civil purposes, actually flying and in use.

There was still a vast field open for research in all branches of aeronautical science. Research work in aeronautics could not be looked upon altogether as a whole by itself. It was the intention of the Air Ministry that aeronautical research should be closely connected with other branches of research in this country. If they tried to develop research entirely from an aeronautical point of view, they would not be able to draw on all the resources available, all the various laboratories available in London, and the various universities.

He hoped a scheme would shortly be in operation whereby they would be able to advance aeronautical research hand in hand with research in other branches of science and industry. He hoped the research department, of which he had lately been appointed the head, would prove to some extent the successors of the pioneers who had laid the foundation of aeronautical science in this country. (Cheers.)

Lieut.-Col. OGILVIE did not think they could expect the rate of development of the last few years to be maintained. That rate had only been attained by the expenditure of an enormous amount of money. But, though some little time might be needed for the work, aviation would certainly take a permanent position in the business life of the community.

One of the obstacles to the use of aircraft for the general community was the fact that it was necessary for aeroplanes to run up a gradient. That gradient, which was once one in four, was now one in eight, and he thought within 10 years it would be one in 16. The flatter the gradient, the cheaper aerial transport would be. The present air machines were not sufficiently durable for commercial purposes, but by means of a metal design machines might be made to last four or five years. Fog was still a serious difficulty; it was not possible to land successfully in a fog.

Mr. J. BAIN TAYLOR asked whether an aerial post, readily accessible to business men, could not be established. He had seen an aerial post-box in an American business men's hotel.

Lieut.-Col. BRISTOW said the circumstances in this country differed from those of the United States. When the time taken in collection and delivery formed a large proportion of the total time of transmission, the advantage of using the aeroplane was diminished. The establishment of a great scheme of postal service with the Continent was, however, under consideration. There would be a very complete postal service to France, Italy, Egypt, and even South Africa. It would be possible by this service to send samples and small packages.

Another member asked if at the present time a business man could fly from London to Manchester and then to Glasgow and return the same day.

Lieut.-Col. BRISTOW jocularly replied that it would depend upon the day chosen. If it were a Tuesday or a Friday and a visit were paid to the Exchange bar, he thought it probable that the journey would not be completed. If any other day were chosen he saw nothing to prevent such a flight being made.

THE TRANS-ATLANTIC COMPETITION.

The bad weather, it is alleged, is responsible for the failure of the various competitors to fly the Atlantic during the last week.

It would appear from the numerous reports that so certain are the Americans of success that they are "lining the route" with no fewer than 54 destroyers, not to mention some half-dozen light cruisers and various other craft, complete with ship-planes.

The Ardath Tobacco Company, Ltd., have achieved fame by the offer of an additional prize of 2,000 guineas for the trans-Atlantic flight.

False Weather Reports.

The sensation of the week occurred on April 23rd when those in Newfoundland were asked by the Air Ministry to explain the reasons of the failure of the Martinsyde and Sopwith pilots to start. The reply was that, owing to adverse weather reports the start had naturally been delayed. The Air Ministry meteorologists, who had reported the weather favourable, were unable to understand whence such reports had come, and so far as one knows nothing has yet come to light.

Newfoundland, not having directional wireless, apparently could not say whether the reports came from the South or the East.

The Air Ministry made the following announcement on April 24th regarding this phenomenon :—

Frequent statements have appeared in the Press during the past few days that there was an extraordinary divergence of views in England and Newfoundland regarding the weather conditions in the Atlantic. In some cases the suggestion has been made that the Air Ministry Weather reports were inaccurate.

It cannot be too strongly emphasised that the Air Ministry forecasts are framed in conjunction with the reports from the United States Weather Bureau, the Canadian Meteorological Office, the R.A.F. Meteorological Officer at Newfoundland, the Azores, the principal Meteorological Stations on the Continent, ships on the Atlantic route, and Home Stations. They take into account not only weather conditions existing along the Atlantic course, as notified by ships, but also show what weather may be expected according to the information available from the sources mentioned.

The weather statements, which are being sent by newspaper correspondents from Newfoundland, are entirely unofficial, and have not been in conformity with the information received at the Air Ministry. The R.A.F. Meteorological Officer at Newfoundland confirms this statement in a message received by wireless to-day in which he stated :—"No weather reports given by me to the Press. . . . Anything published is without my authority."

When the official weather bulletin is drawn up by the Air Ministry Meteorological Staff local weather conditions in Newfoundland, as furnished by the Meteorological Officer, are considered carefully; and it must also be borne in mind that the bulletin gives the conditions for the whole route information which is of the utmost importance to airmen proposing to undertake the flight. It may happen that although the local conditions are such as to make a start somewhat difficult, yet if these difficulties can be overcome it is possible that the flight may be successfully accomplished. Ideal conditions throughout the whole route, including both starting and landing points, are not considered as likely to occur frequently.

The latest message from St. John's, Newfoundland, states that "consternation was caused in the airmen's camp yesterday (Wednesday) by a message from the British Air Ministry asking the reasons for Mr. Hawker's and Mr. Raynham's failure to start on the Trans-Atlantic flight." It must be stated emphatically that no such message has been sent by the Air Ministry Meteorological Staff. They merely prepare the forecasts; it is not within their province to say that a machine should start. That is entirely a matter for the pilot and his navigator to decide.

The Selecton of Aerodromes.

The Air Ministry have selected Cape Broyle Harbour, south of St. John's, as their headquarters, and the start of the Porte triplane will be made from there. The Handley Page aerodrome is being made at Harbour Grace, and the machine is expected to leave Liverpool on April 29th by S.S. "Digby," of the Furness-Withy Line. An agent of Messrs. Boulton and Paul, Ltd., arrived at St. John's on April 21st to select a site for an aerodrome.

Another Short Flight?

Messrs. Short Bros. are now stated to be reassembling their seaplane preparatory to making a second attempt on the Atlantic Flight. It is stated by Major Sippe that the cause of the unfortunate descent of this machine into the Irish Sea was "most undoubtedly an air-lock which prevented the petrol from reaching the engine."

How Many Boats Make Five?

According to which of the daily news-sheets one happens to be so unfortunate as to read, the number of the American flying-boat competitor varies. The "Daily Mail" prefers N.C.2 or 3, but the other papers entered their choice of numbers from N.C.1 to N.C.5. The U.S. Government have not yet decided whether to use the Newfoundland to Ireland route or the route to Ireland *via* the Azores. It is stated that the machines may use St. Mary's Bay, St John's, as their headquarters. Anyhow, they appear to have sent a substantial draft of men to prepare things in Newfoundland. United States warships "Aroostok," "Baltimore," "Shawmut," and "Melville" are to be used in connection with the flight in a hitherto unstated capacity.

It is stated that the sheds in which the Martinsyde and Sopwith machines are kept are guarded during the day and night by men and dogs.

THE AMERICAN WAY.

According to a message from New York, a feature of the "Victory Liberty Loan" celebration in Washington was the reading of President Wilson's message from an aeroplane. By means of a wireless telephone and the newly invented sound amplifier a crowd numbering about 15,000 assembled on the Treasury steps heard distinctly the words spoken by an Army aviator flying at a height of 2,600 feet. The crowds cheered as the aviator concluded the message

MAJOR DE HAVILLAND IN SPAIN.

Major Geoffrey de Havilland, R.A.F., who is staying for a time in Spain, has flown from Madrid to Seville and back, a distance of 480 miles, in four hours. This, it is stated, is a "record" for the journey.

The machine used by Major de Havilland while giving exhibitions of flying was a De H.9 biplane with a 450 h.p. Napier engine. Major de Havilland is better known as the designer of the famous Airco machines than as an aerial exhibitor.

THE REORGANISATION OF THE UNITED STATES AIR SERVICE.

An official report received from Washington shows how the United States Air Service has been reorganised. Major-General Wm. L. Keney has been relieved of his rank as Major-General in the National Army and of his appointment as Director of Military Aeronautics, and has reverted to his rank as Colonel in the Field Artillery.

Brig.-Gen. Wm. Mitchell, who was Assistant Chief of the Air Service, A.E.F., and later Chief of the Air Service, 3rd Army of the Army of Occupation, has succeeded General Keney as Director of Military Aeronautics.

Major-General Charles P. Mencher, Director of Air Service, has announced the names of his staff. They are as follows:—

EXECUTIVE STAFF.

Executive Officer, Colonel Milton F. Davis, A.S., A.

First Assistant Executive, Colonel William E. Gillmore, A.S., A.

Second Assistant Executive, Major Horace M. Hickam, A.S., A.

Third Assistant Executive, Brig.-General William Mitchell, U.S.A.

Fourth Assistant Executive, Lieut.-Colonel William F. Pearson, A.S., A.

TECHNICAL ADVISORY STAFF.

Supply:—

Chief, Air Service Property, Lieut.-Col. Augustine W. Robins, A.S., A.

Chief, Air Service Procurement, Col. Chalmers G. Hall, A.S., A.

Chief, Air Service Matériels Inspection, Lieut.-Col. George W. Mixter, A.S., A.P.

Chief, Air Service Finance, Lieut.-Col. Alex. C. Downey, A.S., A.P.

Chief, Air Service Aeronautical Engineering, Col. Thurman H. Bane, A.S., A.

Training and Operations:—

Chief Air Service Training. (Detail to be announced later.)

Chief, Air Service Operations, Lieut.-Col. Lewis H. Brereton, A.S., A.

Chief, Air Service Gunnery, Lieut.-Col. Harold E. Hartney, A.S., A.

Chief, Air Service Communications, Col. Clarence C. Culver, A.S., A.

Chief, Air Service Balloons and Airships, Col. Charles DeF. Chandler, A.S., A.

ADMINISTRATIVE STAFF.

Chief, Air Service Personnel, Lieut.-Col. Rush B. Lincoln, A.S., A.

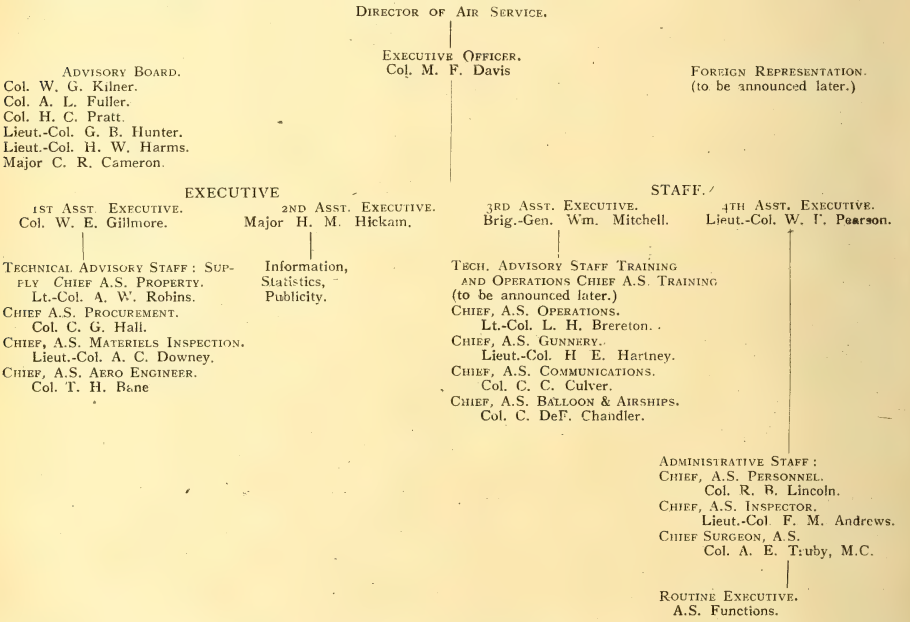
Chief, Air Service Inspector, Lieut.-Col. Frank M. Andrews, A.S., A.

Chief Surgeon, Air Service, Col. Albert E. Truby, M.C.

The following named officers have been designated as an Advisory Board, Air Service:—

Colonel Walter G. Kilner, M.A., A.S., A.; Colonel Arthur L. Fuller, A.S., A.; Colonel Henry C. Pratt, A.S., A.; Lieut.-Col. George B. Hunter, A.S., A.; Lieut.-Col. Henry W. Harms, J.M.A, A.S., A.; Major Charles R. Cameron, A.S., A., Secretary.

The following Chart explains the various functions of the Executive Staff:—



U.S.A. NAVAL AVIATION.

Although hostilities have now ceased, it seems very improbable that U.S.A. Service aviation in general, but Naval aviation in particular, will be neglected. Several Naval officers have lately put forward arguments in favour of a large Naval air froce which should appeal to the country as convincing. These statements are to be considered by the Committee on Naval Affairs of the House, who will, presumably, authorise the necessary financial appropriation for aviation purposes.

Capt. Steele, speaking in favour of a large Naval air force, recently addressed the Committee. He pointed out that the advisability of establishing a number of air stations on both the Atlantic and Pacific coasts had been under the consideration of the Navy Department ever since Naval aviation started. They have not, however, been put into operation during the period of hostilities because of the fact that the only nations on the western seaboard were allies, who might have misconstrued the object.

The Chairman of the Committee asked why a large Naval air force was now needed, as Germany would have to deliver up her existing aircraft and would not then, it was thought, be in a position to build many more. Capt. Steele replied that he was not considering that Germany was the only possible enemy.

Capt. Steele stated that it was estimated that $85,649,300 would be needed for Naval aviation. Which sum would be expended under the direction of the Secretary of the Navy for "procuring, producing, constructing, operating, preserving, stor-

ing, and handling aircraft; for the establishment and maintenance of aircraft stations, including the acquisition of land by purchase, donation. or condemnation; and for experimental work in the development of aviation for Naval purposes."

Capt. Steele pointed out that this estimate was made up of the types of machines which would most probably be required before the end of June, 1920. These are:—108 fighting escorts, at a cost of about $10,000 each; 54 large patrol machines, at $24,000 each; 54 small patrol machines, at $14,000 each; 108 fleet type machines, which have yet to be developed, at $10,000 each; and 300 school machines, at $6,500 each. Besides which, a general sum of $2,000,000, to be expended on experimental work for the development of heavier-than-air craft. was added.

For lighter-than-air craft, Capt. Steele estimated the requirements for the year at 560 kite-balloons, at $4,000 each; 114 twin-engine coastal airships, non-rigid type, at $75,000 each; 12 large non-rigid airships, at $250,000 each; 4 rigid airships, at $1,500,000 each; and 10 free balloons, at $25,000 each.

Further possible expenditure is as follows:—Instruments, including radio sets, $500,000; 100 winches for kite-balloons, at $3,000 each; operation of coastal stations, $8,000,000; expansion of coastal stations, $42,460,000; operation of training stations, $3,000,000; experimental work not otherwise covered, $3,000,000; for clerical, drafting and technical force. $300,000.

It is not known whether the fighting escorts are single-seater or two-seater machines, although the armament—four machine-guns and two light bombs—points to the latter. This type is called the Dunkirk type and attained a speed of 108 knots an hour when tried last year. Besides this, however, a machine designed and built by Mr. Kirkham, of the Curtiss Engineering Plant, which attained a speed of 140 knots an hour last year, is being experimented with, and may be used as a fighting escort.

The large patrol machines are the twin-engined tractor biplanes of the F5 type, which have a speed of 77½ knots an hour, armed with two 500-lb. bombs and four machine-guns.

The small patrol machines are the H.S.2 type flying-boats now in general servive. These are armed with two 230-lb. bombs and one machine-gun, developing a speed of 78.2 knots an hour. As previously mentioned, the fleet-type machine has not yet been developed.

The school machines for instructional purposes are the N.9 float type seaplanes, and small flying boats. Also, a number of JN.4 and Thomas-Morse types capable of operating either from the land or the decks of ships—will be put into commission.

The following stations have already been established; the figures denote the number of machines—all seaplanes—operating from each:—

Chatham, Mass., 24; Rockaway, Long Island, 24; Cape May. N.J., 24; Hampton Roads, Va., 24; Morehead City, N.C., 12; Brunswick, Ga., 18; Miami, Fla., 12; Key West, Fla., 24; Galveston, Tex., 24; Canal Zone, 24; and San Diego, 24. Of these, the stations at Morehead City, Brunswick, and Galveston, Tex., are under construction, but not yet completed. The establishment of a further number of stations has been recommended at Narragansett Bay, 24; St. Thomas, West Indies, 18; San Francisco, 24; Seaward, Alaska, 6; Pearl Harbour, Territory of Hawaii, 24; Hilo, 12; Port Apra, Guam, 12; and Cavite, 24.

It is expected that the most important accomplishments of Naval aviation for the year 1920 will be experimental.

It is proposed to use kite-balloons for observation purposes both at the stations and with the fleet. They will be located at the following stations, with the numbers as mentioned:—

Boston, 6; Narragansett Bay, 6; New York, 6; Cape May, 6; Hampton Roads, 6; Yorktown, Va., 12; Charleston, S.C., 6; Brunswick, Ga., 6; Key West, 6; Pensacola, 6; Galveston, Tex., 6; St. Thomas, 6; Port Angeles, 6; Columbia River, 6; San Francisco Bay, 6; San Diego, 6; Seward, Alaska, 4; Pearl Harbour, 6; Hilo, 6; Port Apra, 6; and Cavite,6.

For the twin-engined airships it is proposed to establish stations at the following places:—

Some point in New England, between Rockland and Portland, which has not yet been located, 4; Chatham, 2; Montauk, 4; Cape May, 4; Hampton Roads, 4; Charleston, 4; Miami, Fla., 2; Key West, 2; Port Arthur, 2; Canal Zone, 2, St. Thomas, 4; Port Angeles, Wash., 4; Columbia River, 4; San Francisco Bay, 4; San Diego, 2; Seward, Alaska, 4; Pearl Harbour, 4; Port Apra, 4; and Cavite, 4.

The large non-rigid airships are to be used for extended patrols, in conjunction with the fleet, and scouting purposes. The free balloons will be used for giving the airship and kite-balloon personnel a preliminary training.

The following is a summary of the estimated costs of construction of all stations proposed and recommended in the plan of patrol and protection, except the stations at Guantanamo, Samana Bay, and all the rest stations on the Pacific coast and Pacific Islands:—

Atlantic, Gulf Coasts and Caribbean Sea.

New England airship station	$1,175,000
Narragansett Bay seaplane and kite balloon station	$1,365,000
New York airship station	$2,250,000
Port Arthur airship station	$1,750,000
Sir Thomas airship and kite balloon station	$2,865,000
Canal Zone seaplane, airship and kite balloon station	$2,490,000
Lighter-than-air experimental station	$8,200,000
Expansion of existing station	$6,310,000
Total	$26,980,000

Pacific Coast, Alaska, and Pacific Islands.

Port Angeles airship and kite balloon station	$2,033,000
Columbia River airship and kite balloon station	$2,033,000
San Francisco airship, kite balloon and seaplane station	$3,250,000
Seward airship, kite balloon and seaplane station	$2,449,168
Pearl Harbour airship, kite balloon and seaplane station	$3,250,000
Hilo seaplane and kite balloon station	$975,500
Port Apra airship, kite balloon, and seaplane station	$2,726,500
Cavite kite balloon and seaplane station	$3,250,000
Total	$46,947,168

Besides these, it is proposed to establish twenty-five rest stations at various places. No estimate is given for these as there is, as yet, no certainty as to exactly what the stations will contain. It is, however, expected that they will consist of petrol, oil and water storage facilities, with road and telephone connection.

MEDICAL STANDARDS.

According to the "Evening News" the International Commission on aviation in Paris have laid down a definite medical standard for all pilots, civil and military. Four distinct tests must be passed.

Family History and Record, or Psychological Test: A searching inquiry into the pilot's antecedents. These invariably have a far-reaching effect on temperament.

Test for Mental Aptitude: Ingenious devices, including instruments to test the quickness of the brain will be used. The time taken from the action of the brain to the action of the hand can be measured to the hundredth part of a second.

Physical Test, and examination for any surgical abnormalities, such as wounds, etc.

Eyesight Test: A great majority of the crashes on landing are due to a visional defect. Heterophoria, or concealed squint. was found in many cases. By means of eye exercises this can be cured; during the war a special school for such cases was set up at Greenwich.

All pilots will be tested every six months for any signs of fatigue, and unless certified as absolutely fit, will not be allowed to fly.

Their licenses will be suspended for a period decided by the medical examiners.

At Croydon Aerodrome a special squadron is at work teaching all repatriated airmen prisoners to fly the latest types of machines.

The medical side of the squadron is in charge of Major T. S. Rippon, who has made a special study of airmen. His valuable data was used as a basis for the discussions in Paris.

[One presumes that by "airmen" the "Evening News" means Flying Officers.—Ed.]

FLYING FROM JUSTICE.

"One of the problems of the future," according to the "Times," "will be the effect which civilian flying will have upon crime and the escape of the criminals. In the United States arrangements have already been made for the training of aerial police, and the flying routes during the aviation meeting of the Pan-American Aeronautical Exposition will be guarded by the police next month.

"Aerial police will be required in all countries to prevent violation of the rules of the air, when flying becomes general, but a much more serious problem will be to prevent criminals escaping from the country by aeroplane. Customs authorities will undoubtedly deal with the aerial smuggler, and it is possible that the same authorities may be able to do something towards catching the criminal who is trying to get abroad by air.

"The man with nothing incriminating upon him, who is merely anxious to get away in order to secure his own personal safety, is a much more difficult case. It is not anticipated that many criminals will have their own aeroplanes for some time yet, but when aerial passenger services to the Continent become a regular thing they may be used by people anxious quickly to make their escape."

One would suggest that it might be more easy to trace a criminal who travelled by an aerial passenger service than one who attempted to escape by train, as for a long time the field of inquiry will be very limited.

BOOKS REVIEWED.

FLY-PAPERS.

A most appalling vertical gust, "rich-nourished," as M. Mortane would say, overcame "The Whip" as he found himself hung in mid-air at 3,000 feet on his first solo.

"Was the machine *never* going to stop climbing? *What* a a fool! Of course, the throttle. Here I was, three times as high as I was told to go, and all my own fault. Worse than that, I had been running the engine 'all out,' a heinous offence. Mentally cursing myself for my folly, I eased back the throttle lever and looked over the side, without any definite hope, and began searching the country for some open space on which it might be possible to land.

"As I looked, I almost shouted for joy. There, almost directly beneath me" (for the last half-hour it had eluded me with the diabolic perversity of a collar-stud) "was the aerodrome. Yes, those were the hangars and huts, those queer little things like dolls' houses. Thank God, I had found it at last! I pushed the nose of the machine down, pointing it at the aerodrome.

"Down, down I went. I was terrified of losing the aerodrome again, and scarcely dared risk taking my eyes off it. I did so only to steal occasional glances at my instruments. The wires first began to hum and then to shriek. I looked at the air-speed indicator. A hundred miles an hour—that would never do. I pulled the stick back, and in my excitement overdid it and nearly stalled the machine . . . essayed a gentle turn, keeping the aerodrome in view all the time . . . I calculated that I should touch the ground almost in the centre. . . . The time to flatten out was fast approaching.

"With a thumping heart and every nerve strained I watched the ground rushing up to meet me. Nearer and nearer it came—in another moment I would flatten out—now—Crash!!!! I had delayed too long. . . .

"The instructor surveyed the wreck sorrowfully for a moment, shaking his head, and then, turning to me, said: 'And I told you not to stunt. These loops on the ground simply aren't done by the best people.'"

That's what you might call a "slice of luck," and it is rendered more real by the brief account following of the hero's righteous indignation at the brother "Hun" who attempted to steal his nice splintered propeller. Quite rightly he told him to crash one for himself if he wanted a walking-stick.

"Fly-papers" (R. Ward & Sons, Newcastle-on-Tyne; 2s.), from which the above racy account is taken, is quite a jolly little book, being a series of war silhouettes which are none the less attractive for being unpretentiously written and sold at a moderate price.

Having, in Pyecroft's classic phrase, "bought an 'am," he proceeded to "see life," and at the outset of his career in the air nearly deprived us of these memoirs by wandering into a very pretty Hun trap. Far off he had watched what seemed to be a formation of our scouting machines doing an offensive patrol. They were being heavily engaged by anti-aircraft guns, and were diving and darting about along the ominous black bursts.

"So long as they are there," he thought, "we have nothing to fear." So he went hunting for photographs with a mind at rest. When a heavy barrage of Archie fire was put up to the westward of his machine he woke up to find himself the object of concentrated attention on the part of seven of those scouts which he had seen but a moment before being ringed by the fire of their own batteries. Richthofen & Co. had sprung their trap!

He manœuvred like a dragon-fly, "never doing the same thing twice in succession." "My observer," he writes, "was fighting magnificently. He was perfectly cool and collected, changing the ammunition trays with a speed and precision born of long practice, never wasting a shot, but by means of short, rapid burst of fire preventing the enemy machines getting very close. At last one of the enemy machines determined not to let us escape, dived close in and opened fire. A group of holes appeared in the wing close beside me, and my revolution counter flew into a thousand pieces. My observer's gun spoke, and the enemy's ceased. I caught a momentary glimpse of his machine as it went spinning down underneath me."

The rest of the Huns drove him down to 7,000 feet, but, laying Falstaff's maxim to heart, chose the better part of valour in the end.

There is a vivid silhouette of a German N.C.O. pilot who landed on the British aerodrome without his observer having shown fight, much to the puzzlement of the squadron. When they came to look in the observer's seat they beheld:

". . . in a drunken sleep, camouflaged as a gentleman, in the gorgeous mess uniform of a crack Prussian regiment, a splendid specimen of Prussian militarism. He was the very embodiment of his species, even to the stentorian blast from his nasal organ, which announced to the world his type. It appeared that the previous evening he had taken part in one of those drunken orgies of which the German Crown Prince is the high priest . . . the debauch had apparently lasted until well into the morning hours, and the recumbent gentleman had torn himself away just in time to crawl or be carried and dumped into the machine ready for the early morning reconnaissance."

In fact, he didn't make a very good impression.

There are many thumb-nail etchings in the volume, such as this:

"It is not a pleasant thing to see the phantom-like form of a huge shell flash smoothly, silently past a few feet in front of one's machine. You cannot hear it. The noise of the engine drowns the shriek, but one sees it almost as a spectre moving across the path of one's vision. . . . I have seen a machine suffer a direct hit.

"The effect on the mind is a peculiar one. At the time it is nothing like so disturbing a sight as seeing a machine brought down in flames, nor yet even of one crashing to the earth out of control. One moment one sees a machine cruising along in a perfectly normal manner; the next there is a blinding flash, a puff of smoke, and then—nothing. Everything appears just the same as before, except that the machine has disappeared, vanished from out the sky. It is difficult to realise that in one blinding flash two souls have gone to meet their Maker. . . ."

The author writes with a natural ease, tempered by an occasional spurt of gaiety, which renders his book an enjoyable interlude. In spite of the becoming diffidence with which he offers his entertainment, the volume is better worth while than many which have been noisily heralded; which goes to prove yet once more that the cardinal rule of writing is, "Have something to say, and say it."— R. H. Britain.

OUR FIRST AIRWAYS.

[By Claude Grahame-White and Harry Harper. (John Lane, The Bodley Head. Price 6s. 6d. net.)]

The chief characteristic of this book is its obviousness. Upon reading it one receives the impression of having heard it all before, which may be owing to the fact that the book appears to be principally compiled from Mr. Grahame-White's recent juvenile lecture on commercial aeronautics, delivered before the Aeronautical Society.

One has it on the publishers' authority—*vide* the slip cover—that "this book, written by two experts who have studied aeronautics from its very inception, may be regarded as a standard work on air-way organisation, equipment and finance, and contains all the latest information as to this fascinating subject."

After such a statement what can one say? Especially as the writer has no wish to become an expert on commercial aeronautics, and is openly pessimistic as to the future thereof.

One disagrees with the extremely optimistic vein in which the book is written. The authors throughout appear to take it for granted that commercial aeronautics is an established fact, and that in the space of a few weeks—months at the most—"airways"—horrible word—will be in full working order, and aerial services will be running to all parts of the earth. When one stops to consider such admittedly unimportant drawbacks as the weather and the internal state of various countries on the most important overland routes, one wonders if this will be the case.

". . . neither wind nor rain would have any detrimental effect at all on the flight of the machine . . ." (p. 71). One merely asks whether the R.A.F. Aerial Peace Conference Mail have found this so.

The book abounds in obvious statements such as that to be found on page xi of the Introduction: "If it cannot be combined with safety and with an ability to fly regularly to a daily timetable, then the use of the air will always be irregular, and air services will be unable to compete with other methods of transport.

Nevertheless, the book should be well received by that section of the public for whom it appears to have been written, namely, the entirely uninitiated, or those with but a little knowledge of aeronautics. There is some quite good stuff in the book, and the language in which it is written assures it being understanded of the above-mentioned class.

The illustrations in the book are reproduced from drawings by Mr. Geoffrey Watson, several of which appear in the catalogue issued by the Grahame-White Company. This Company is at pains to let the readers know that "the pictures showing commercial and pleasure-type machines were produced by Mr. Watson from drawings prepared by the designing staff of the Grahame-White Company.

Particularly amusing is the picture facing page 78, showing a method of illuminating an aerodrome in fog. One wonders if the authors of the book, who are undoubtedly responsible for the idea incorporated in this picture, have ever experienced the effect of fog upon the searchlights at present available. Possibly they may have added to their other claims to fame by the invention of a new fog-penetrating searchlight, throwing a vertical beam. Certainly there is no such thing in existence, efficient though the British Army is.

Mr. Claude Grahame-White's many admirers will doubtless be pleased to learn that the frontispiece of the book consists of a studio portrait of Mr. Grahame-White.—S. F. B.

NAVAL & MILITARY AERONAUTICS

FROM THE "LONDON GAZETTE."

Air Ministry, April 25th.

R.A.F.—The following temp. appointments are made at the Air Ministry :—Staff Officer, 2nd Cl.—(Air.)—Maj. R. M. Field, March 17th.

Staff Officer, 3rd Cl.—(Air.)—Capt. F. W. Walker, D.S.C., A.F.C., March 24th.

Staff Officer, 4th Cl.—(P.)—Lt. B.H. Godfrey, March 5th

The following temp. appointments are made :—Staff Officer, 1st Cl. (P.)—Maj. (actg. Lt.-Col.) A. G. R. Garrod, April 7th.

Staff Officer, 3rd Cl.—(P.)—Lt. (actg. Capt.) D. W. Stewart-Saville, M.C., and to retain actg. rank of Capt. whilst so empld., Jan. 3rd.

Flying Branch.—Capt. A. J. O'Reilly to be actg. Maj. whilst empld. as Maj. (K.B.), Oct. 1st, 1918.

Lts. to be Lts. (O.) from (Ad.) :—J. L. Rowe, March 28th; J. F. Titmas, April 9th.

Sec. Lt. C. W. Harrison to be actg. Lt. whilst empld. as Balloon Comm. (K.B.), Oct. 19th, 1918. (Substituted for notification in "Gazette" of March 19th.)

The following relinquish their commns. on ceasing to be empld. :—Lt. B. E Gilbert (Lt., W. Ont. R.), Dec. 14th, 1918; Sec. Lt (Hon. Lt.) F. P. J. Travis (Lt., Quebec R.), Feb. 2nd; Lt. T. F. Flanagan (Lt., E. Ont. R.), Lt. J. R. Rodger (Lt., Alb. R.), March 27th; Sec. Lt. (Hon. Lt.) T. C. Knowles, M.M. (Lt., Brit. Col. R.), Sec. Lt. (Hon. Lt.) S. Knight (Lt., Can. Rly. Serv.), March 19th; Lt. (Hon. Capt.) A. R. C. Morton (Capt., Brit. Co. R.), March 20th; Lt. W. Kidley, D.F.C. (Lt., Brit. Col. R.), March 25th; Sec. Lt. (Hon. Lt.) F. H. Allwood (Lt., Can. F. Art.), March 28th; Lt. (Hon. Maj.) (actg. Capt.) F. I. Tanner (Maj., Nova Scotia R.), April 14th.

The following are transferred to unempld. list :—Sec. Lt. A. R. Quirk, Feb. 1st; Sec. Lt. A. C. Macauley, Feb. 5th; Sec. Lt. G. N. Malcolm, Feb. 10th; Sec. Lt. W. H. Morrow, Feb. 14th; Sec. Lt. J. A Clack, Feb. 15th; Sec. Lt. J. L. McPherson, Feb. 16th; Sec. Lt. W. J. Irwin, Sec. Lt. C. E. McKeand, Sec. Lt. J. Ellis, Feb. 24th; Sec. Lt. G. Stannard, Feb. 26th; Lt. C. E. Mayer, March 2nd; Sec. Lt. D. Mallett, March 4th; Lt. H. K. Cassels, March 5th (substituted for notification in "Gazette," March 28th); Lt. F. S. Crossley, March 7th; Lt. G. W. Holderness, D.F.C., March 9th; Sec. Lt. H. Jackson, March 10th; Sec. Lt. J. McGrail, Sec. Lt. A. G Wright, March 13th; Capt. (actg. Maj.) D. G. Miller, Lt. T. Ratcliffe, March 15th; Lt. (actg. Capt.) G. W. Ferguson, M.C., Lt. C. M. R. Prewett, March 18th; Sec. Lt. R. O. Machin, Sec. Lt. C. Taylor, March 20th; Sec. Lt. R. W. Mitchell, March 23rd; Sec. Lt. A. C. Manu, March 24th; Sec. Lt. D. Rodger, Lt. A. S. Travers, March 24th; Lt. J. Ditchfield, Lt. R. S. Milani, Lt. (Hon. Capt.) D. H. Kylands, Lt. W. R. Thomas, Sec. Lt. B. Troth, Capt. H. V. Terry, Lt. T. Terrell, D.S.C., Sec. Lt. W. Taylor, March 26th; Lt. A. L. Garrett, Lt. G. W. Manton, Sec. Lt. L. S. Macdonald, Lt. R. G. Mitchell, March 27th; Sec. Lt. C. A. Matthews, Sec. Lt. W. S. Kycroft, Lt. J. E. Reid, March 29th; Lt. N. Goudie, Capt. A. G. McEwen, March 30th; Lt. C. A. Jefferson, March 31st; Sec. Lt. D. C. Macdonald, Sec. Lt. H. Mason, Sec. Lt. K. R. Marsh, Capt. S. W. Taylor, M.C., Lt. H. H. Thompson, April 1st; Lt (actg. Capt.) P. R. T. Chamberlayne, Lt. J. C. MacLennan, April 2nd; Sec. Lt. L. S. Elphick, Sec. Lt. D. L. Gould, Sec. Lt. (Hon. Lt.) P. C. Hoyle (R.A.F.), Lt. R. I. Page, April 3rd; Sec. Lt. E. Beale, Sec. Lt. J. K. Grant, Lt. (actg. Capt.) A. R. Mc.K. Scott, Sec. Lt. Maclaverty, Sec. Lt. Norbury, Lt. F. C. Robinson, Sec. Lt. C. E. W. Thresher, Maj. B. Travero, April 4th; Sec. Lt. A. G. Bailey, Sec. Lt. W. C. Marsh, April 5th; Lt. (actg. Capt.) J. W. Beebee, Sec. Lt. F. L. Hill, Sec. Lt. J. A. Kelynack, Sec. Lt. J. N. Mallam, Capt. B. B. Toms, April 6th; Sec. Lt. W. J. Collett, Lt. V. G. Emery, Sec. Lt. F. W. Elliott, Sec. Lt. W. A. Ford, April 7th; Capt. A. H. Ayre, Sec. Lt. (Hon. Lt.) A. Craig, Sec. Lt. J. H. Cuthbertson, Sec. Lt. H. S. Chapman, Sec. Lt. W. H. Coghill, Sec. Lt. H. D. Cleveley, Lt. N. J. R. Macdonnell, Sec. Lt. E. Robinson, Sec. Lt. C. F. Temple, April 8th; Lt. A. K. Bamber, Sec. Lt. R. Burgess, Sec. Lt. C. C. Carlow, Sec. Lt. G. H. Buderby, Sec. Lt. T. D. Edgar, Maj. L. A. Farley, Sec. Lt. J. Cricket, Lt. W. T. Grant, Sec. Lt. J. Golding, Lt. E. L. McLeod, Sec. Lt. J. M. McLeod, Sec. Lt. (Hon. Lt.) W. R. B. Mann, Lt. (actg. Capt.) B. Monkhouse, Lt. (actg. Capt.) R. T. Mark, M.C., Sec. Lt. F. J. Reynolds, Sec. Lt. N. S. Todd, Lt. F. R. Waddington, Sec. Lt. E. E. Welby, Sec. Lt. S. Whittaker, April 9th; Sec. Lt. E. P. Blackmore, Lt. N. B. Eames, Sec. Lt. S. E. Foreman, Sec. Lt. C. S. Fowler, Lt. E. T. Griffiths, Lt. V. H. Legg, Sec. Lt. T. B. Lowton, Sec. Lt. A. F. Manton, Lt D. M. Matthews, Lt. A. P. Morley, Lt. F. R. Murray, April 10th; Lt. J. A. Beeney, D.F.C., Capt. F. S. Barnwell, O.B.E., A.F.C., Lt. C. Booth, Sec. Lt. H. Baldwin, Lt. C. D. Chapman, Lt. E. C. Dickens, Capt. J. Y. McLean, M.C., Sec. Lt. (Hon. Lt.) F. C. Roberts, Sec. Lt. F. Sweeley, Capt. G. R. Riley, Lt. G. H. Welsh, April 11th; Sec. Lt. T. Allan, Lt. A. V. Evans, Lt. (actg. Capt.) W Grossart, D.F.C., Sec. Lt. H. Millburn, Sec. Lt. C. J. Rae, Lt. E. J. Withers, April 12th; Lt. A. E. Cambridge, Sec. Lt. G. S. Eby, Sec. Lt. G. G. Foolkes, Lt. J. Farley, Capt. C. M. G. Farrell, Sec. Lt. M. Fearman, Sec. Lt. W. A. Greene, Sec. Lt. D. Gosnell, Sec. Lt. J. Graham, Lt. T. C. Harris, Sec. Lt. C. B. Loomis, Sec. Lt. J. H. McLeod, Sec. Lt. W. A. McKinnon, Sec. Lt. W. J. McNab, Sec. Lt. R. P. McHaffie, Sec. Lt. J. A. Matthews, Capt. A. S. Mather, Sec. Lt. L. R. Mattern, Sec. Lt. J. M. Martin, Sec. Lt. N. C. MacDonald, Lt. (actg. Capt.) E. P. McIlwraith, D.F.C., Lt. A. L. Mc-Larden, Lt. R. Randall, Sec. Lt. K. Runciman, Sec. Lt. N. Rowlands, Sec. Lt. H. H. Towne, Lt. C. G. H. Winter, April 13th; Sec. Lt. E. B. Marsh, Lt. W. E. Reynolds, Lt. G. S. Ranshaw, Sec. Lt. R. J. Steele, April 14th; Lt. (actg. Capt.) J. E. H. Dakin, Sec. Lt. (Hon. Lt.) G. E. Davis, M.C., Lt. A. C. Goldsmith, Sec. Lt. G. W. Harvey, Sec. Lt. N. P. Hilton, Lt. F. G. Jones, Sec. Lt. C. Lawie, Sec. Lt. C. K. Mc-Arthur, Sec. Lt. S. B. Milner, Lt. L. B. May, Sec. Lt. T. S. McKechnie, Sec. Lt. M. C. McLeod, Sec. Lt. C. E. Marrin, Sec. Lt. A. H. Maynard, Sec. Lt. W. G. Roberts, Lt. J. A. Reeve, April 15th, Sec. Lt. L. S. Duffill, Sec. Lt. C. D. Davidson, Sec. Lt. C. H. Ford, Sec. Lt. W. T. Ganter, Sec. Lt. (Hon. Lt.) C. J. R. Gibson, Sec. Lt. D. McInnyre, Sec. Lt. (Hon. Lt.) J. T. Rose, April 16th; Sec. Lt. A. D. E. S. Ades, Sec. Lt. R. Davies, Sec. Lt. C. P. Durkin, Sec. Lt. G. A. W. Garland, Sec. Lt. A. J. Goodship, Sec. Lt. C. Kirkwood, Lt. A. J. Marsden, Lt. D. A. McKerron, Lt. R. N. McLean, Lt. D. W. McLeod, Lt. C. M. Martin, Sec. Lt. J. B. Risk, Sec. Lt. S. M. Robins, Lt. G. Rodgers, Capt. L. H. Rochford, D.F.C., D.S.C., Sec. Lt. C. J. Thomas, April 17th; Sec. Lt. W. Cox, Sec. Lieut. R. E. Cathrow, Sec. Lieut. H. V. Cox, Lieut. R. P. Greey, Lt. (Hon. Capt.) (actg. Capt.) C. B. Glynn, Sec. Lt. C. B. Harold, Sec. Lt. E. Haskins, Sec. Lt. G. C. R. List, Sec. Lt. F. G. C. Maggs, Lt. A. D. Pole, Sec. Lt. P. W. Ross, Lt. (Hon. Capt.) H. Rogerson, April 18th; Sec. Lt. L. S. Collard, Sec. Lt. D. H. W. Cropley, Sec Lt. A. J. Elvin, Capt. S. J. Fetherston, Lt. C. McM. Russell, Sec. Lt. C. C. Woods, April 19th; Sec. Lt. J. H. Laycock, Lt. L. A. Lewis, Lt. F. A. W. Mann, Sec. Lt. E. H. Rossington, Sec. Lt. R. A. Rutter, April 20th; Sec. Lt. S. V. Annis, Sec. Lt. A. R. Bloxham, Sec. Lt. H. C. S. Drake, Lt. S. G. Mawdsley, Sec. Lt. F. J. W. Miles, April 21st; Lt. (actg. Capt.) J. W. Aldred, M.C., Sec. Lt. L. Arnold, Sec. Lt. J. G. Cootes, Sec. Lt. F. Gandy, Lt. G. W. G. Gould, Lt. H. J Hudson, Sec. Lt. J. A. Massey, Sec. Lt. H. M. Passmore, April 22nd; Lt. L. F. Lomas, April 24th; Sec. Lt. J Brombam, April 25th.

Maj. (actg. Lt.-Col.) J. A. Cunningham, D.S.O., D.F.C., resigns his commn. and is permitted to retain rank of Lt.-Col., April 26th.

Sec. Lt. (Hon. Lt.) M. G. Robson relinquishes his commn. on account of ill health caused by wounds, and is permitted to retain rank of Lt. April 26th.

Sec. Lt. B. Digby-Worsley relinquishes his commn. on account of ill health contracted on active service, and is permitted to retain his rank, April 26th.

Sec. Lt. G. Roberts (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt. (A.) (July 7th, 1918) (substituted for notification in "Gazette," Nov. 26th, 1918).

Rank of Sec. Lt. A. Beck is as now described, and not Lt. (actg. Capt.) as stated in "Gazette," March 28th.

Initials of Lt. A. C. Anderson are as now described, and not A. C. D as stated in "Gazette," March 7th.

Administrative Branch.—Lts. to be actg. Capts. while empld. as Capts. :—(Hon. Capt.) R. G. Kitson, from (O.), May 18th, 1918 (substituted for notification in "Gazette," Jan. 24th); H. F. W. Bailey, July 20th, 1918; W. E. N. Growden, April 5th; M. J. Norton, from (A. and S.), Jan. 1st.

Lts. (A.) to be Lts. :—C. F. Palmer, Nov. 14th, 1918; C. A. Jordan, Feb. 3rd; M. G. Begg, M.C., Feb. 18th; D. S Cairnes, March 3rd; I. R. V. Hill, J. M. Purcell, March 4th; R. A. Maddock, March 7th; H. Austin, March 14th; C. W. E. Browse, March 17th; A. Colley, T. P. L. Molloy, J. L. Sawyer, April 17th.

Lt. S. Wallingford to be Lt., from (A. and S.), March 12th.

Lts. (K.B.) to be Lts. :—A. J. Johnston, Feb. 17th (substituted for notification in "Gazette," March 14th); (Hon. Capt.) G. S. St. Noble, March 6th; F. G. Taylor, March 11th.

Lts. (O.) to be Lts. :—J. St. G. George, Nov. 25th, 1918; A. Lomax, M.C., Nov. 28th, 1918; E. D. Warburton, Dec. 15th, 1918; J. Y. Baird, Feb. 22nd.

Lt. J. W. Hustwaite to be Lt., from (S.O.), April 1st (substituted for notification in "Gazette," April 18th).

G. A. Miller (T./Lt., E. Surr. R.) is granted a temp. commn. as Lt., July 18th, 1918, with seny. from April 1st, 1918.

Sec. Lt. H. F. Joy to be Lt., Feb. 30th.

R. H. Walker (Sec. Lt., Essex R.) is granted a temp. commn. as Sec. Lt., and to be actg. Lt. whilst empld. as Lt., April 1st, 1918.

Sec. Lts. to be Sec. Lts., from (A.) :—C. S. Dunbar, Nov 6th, 1918; W. W. McBain, Dec. 3rd, 1918; A. Barrington, Dec. 16th, 1918; Wilson Campbell, Jan. 17th; H. S. Stidston, Jan. 23rd (and to be Hon. Lt.); J. Silvester, Feb. 4th.

Sec. Lts. to be Sec. Lts., from (A. and S.) :—C. W. Irving, A. H. Betteridge, April 4th.

Sec. Lt. P. Lovery to be Sec. Lt., from (K.B.), Jan. 3rd.

Sec. Lts. to be Sec. Lts., from (O.) :—T. W. Hopley, Nov. 29th, 1918; F. A. Hall, Dec. 11th, 1918; F. H. Perry, March 1st; G. Storey, March 4th; M. G. Robson, M.C., April 3rd (and to be Hon. Lt.); J. T. White, April 4th.

The following are transferred to the unempld. list :—Lt. S. Hunter, Jan. 22nd; Sec. Lt. (Hon. Lt.) A. G. Thomson, Jan. 25th; Lt. (actg. Maj.) H. S. Quickett, Feb. 26th; Lt. R. R. F. Cookson, Sec. Lt. A. C. Thornitt, March 16th; Sec. Lt. E. A. Mann, March 17th; Sec. Lt. F. A. Mansfield, March 24th; Capt. C. V. Booth, Sec. Lt. D. E. McIntosh, Sec. Lt. H. F. Tattersall, March 27th; Capt. W. Hayward (S.O.), March 30th; Sec. Lt. G. L. Griffiths, March 31st; Sec. Lt. H. J. B. Franks, Lt. (actg. Maj.) A. C. Rowden, Capt. W. E. E. Stone (Devon R.), April 1st; Lt. (actg. Capt.) A. W. R. Matthews, Lt. F. G. W. Taylor, April 2nd; Sec. Lt. (actg. Capt.) J. M. Allister, April 5th; Capt. J. S. Michie, M.C., Lt. D. B. Maitland, D.S.O., April 8th; Sec. Lt. W. J. Lee-Bird, April 6th; Sec. Lt. H. T. Duke, Capt. J. S. Leslie, April 10th; Lt. (actg. Capt.) R. C. Ashfield (Black Watch), Sec. Lt. D. Miller, Sec. Lt. A. G. Redstone, Sec. Lt. W. Staley, April 11th; Lt. T. McGovern, April 12th; Sec. Lt. A. N. MacIntosh, April 13th; Sec. Lt. G. L. Rawkins, April 14th; Sec. Lt. A. S. Mansfield, Capt. H. G. Tweedie, April 5th; Capt. C. S. Goddard, Lt. D. R. Griffiths, April 16th; Sec. Lt. C. Robertson, Comptbell, Sec. Lt. G. Deacock, Lt. G. C. Hughes, Sec. Lt. F. C. Jones, April 17th; Lt. J. C. Hamilton, April 21st; Sec. Lt. J. MacLarty, April 22nd; Lt. A. H. Jarvis, April 24th.

Sec. Lt. O. W. Owen resigns his commn., April 26th.

The notification in "Gazette," Oct. 15th, 1918, concerning Lt. O. J. Gaspler is cancelled.

The notification in "Gazette," March 25th, concerning Lt. G. T. Dunstan is cancelled.

The notification in "Gazette," March 4th, concerning Sec. Lt. (Hon. Lt.) J. Cobley is cancelled.

The notification in "Gazette," April 11th, concerning Sec. Lt. E. Holt is cancelled.

The notification in "Gazette," Feb. 14th, concerning Sec. Lt. T. Whittaker is cancelled.

Technical Branch.—Capt. (actg. Lt.-Col.) H. A. P. Disney retains the actg. rank of Lt.-Col. whilst empld. as Lt.-Col., Grade (B) from S.O., April 1st.

Maj. (actg. Lt.-Col.) A. Cleghorn to be Maj., Grade (A), and relinquishes the actg. rank of Lt.-Col. on reduction of estabt., April 3rd.

Capt. A. Roberts to be Capt., Grade (B) from Grade (A), Jan. 22nd.

Lt. (Hon. Capt.) O. M. Greg to be Lt. (Hon. Capt.), Grade (B) from Grade (A), Feb. 3rd.

Sec. Lt. F. H. Whitmore, D.S.C., to be actg. Lt. whilst empld. as Lt., Grade (A), Aug. 1st, 1918.

Lt. W. R. Exley to be Lt., from (Ad.), Jan. 1st.

Sec. Lts. to be Sec. Lts., Grade (A) from (Ad.) :—R. F. Tunmer, Nov. 18th, 1918; H. R. Stubbington, Nov. 25th, 1918 (subsututed for notification in "Gazette," Dec. 24th, 1918).

Sec. Lts. to be Lts., from Grade (A) :—C. F. Soanes, Jan. 14th; J. Weeks, A. Sowden (substituted for notification in "Gazette," Dec. 24th, 1918), Nov. 25th, 1918.

Sec. Lts. to be Sec. Lts., from (Ad.) :—E. Hennen, Jan. 11th; M. D. Hart, Jan. 17th.

Sec. Lts. to be Sec. Lts. from Grade (A.) :—C. F. Soanes, Jan. 13th; J. K. M. Dodds (Jan. 15th, and to be Hon. Lt.)

Sec. Lt. T. Lund to be Sec. Lt., Grade (B) from (A), Jan. 13th.

Sec. Lt. (Hon. Lt.) R. H. Hampton to be Sec. Lt., Grade (B) from (R.B), Jan. 15th.

Sec. Lt. A. N. Goodwin (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt., Grade (A), Sept. 10th, 1918.

The following are transferred to the unempld. list :—Sec. Lt. (actg. Capt.) C. H. Quelch, Feb. 1st; Sec. Lt. D. L. Morter, Feb. 8th; Sec. Lt. P. M. Maury, Feb. 11th; Sec. Lt. (Hon. Lt.) W. F. E. MacLaren, Feb. 13th; Capt. F. E. John, Feb. 21st; Lt. J. E. Jones, March 1st; Lt. J. E. Sierra, M.C., March 4th; Sec. Lt. H. S. Adams, March 6th; Capt. F. J. R. Macfayden, March 7th; Lt. D. Gordon, March 8th; Sec. Lt. (Hon. Lt.) W. G. N. Cutts, March 11th; Lt. D. O'B. Gill, Sec. Lt. (actg. Lt.) F. E. Miles, March 19th; Maj. T. E. Robertson, O.B.E., March 22nd; actg. Lt. J. F. Lamonby, March 23rd; Capt. J. W. W. Ashworth, March 27th; Sec. Lt. C. Groves, Sec. Lt. P. H. C. Martin, Sec. Lt. T. Mattocks, March 28th; Capt. (actg. Maj.) H. C. Mills, March 31st; Lt. E. H. Robinson, April 1st; Lt. T. W. King, Sec. Lt. (actg. Lt.) J. O. Furber, April 3rd; Sec. Lt. A. H. Denly, Maj. G. R. Moser, Maj. (actg. Lt.-Col.) J. Romanes, April 4th; Capt. H. B. Leach, Lt. T. R. Mayhew, April 5th; Sec. Lt. W. C. K. Dent, Sec. Lt. G. T. Kitts, April 6th; Lt. (actg. Capt.) B. Colbran, Lt. L. H. Gamble, Sec. Lt. R. Gordon, Capt. J. Gray, Sec. Lt. A. Jennings, April 7th; Sec. Lt. H. C. Baker, Sec. Lt. E. C. Cousens, Lt. E. W. Edwards, Capt. G. E. Thomas, April 8th; Lt. (actg. Capt.) W. M. Arnot, Lt. H. J. Ashwell, Lt. P. Brindle, Lt. T. G. H. Goodacre, Lt. G. H. Wilkinson, Sec. Lt. A. T. Welsh, April 9th, Sec. Lt. (Hon. Lt.) T. L. S. Boyd, Capt. J. B. Beal, Sec. Lt. J. Faux, Lt. B. R. S. Jones (S. Wales Bord.), Sec. Lt. G. J. Mayer, Capt. D. T. McIsh, Lt. J. C. Taylor, April 10th; Capt. C. L. Apps, Lt. R. A. Golden, Capt. E. Mansbridge, Maj. R. H. Mayo, O.B.E., Lt. A. H. Rayner, Sec. Lt. (Hon. Lt.) (actg. Capt.) F. E. Richardson, Lt. W. R. Trounson, April 11th; Capt. G. F. Cole, April 12th; Sec. Lt. F. A. Carter, Sec. Lt. C. Edwards, Sec. Lt. J. G. McK. M. Stronach, April 13th; Lt. (actg. Capt.) C. F. Gorringe, Lt. R. Rutherford, Sec. Lt. T. A. G. Strickland, April 14th; Lt. R. M. D. Fairweather, Sec. Lt. G. Forster, Sec. Lt. (Hon. Lt.) A. G. Green, Sec. Lt. (actg. Lt.) F. C. Topham, April 15th, Sec. Lt. (actg. Lt.) J. J. Mackenzie, April 16th; Lt. H. W. Robinson, April 17th; Lt. J. T. Borthwick, Sec. Lt. G. L. Chesterton, Lt. (actg. Capt.) J. N. Longfield, April 18th; Hon. Lt. H. B. Hurst, April 19th; Lt. M. G. Fountain, Capt. H. Le Jeune, M.C., Sec. Lt. G. H. Mewes, Sec. Lt. J. F. Richardson, April 21st; Sec. Lt. C. L. Champion, Sec. Lt. R. T. B. Wynn, April 22nd; Lt. W. K. Cannon, Lt. (actg. Capt.) A. Graham, April 23rd; Capt. J. Matthews, April 24th.

The following relinquish their commns. on account of ill-health :—Capt. (actg. Maj.) D. G. Nairn, O.B.E., (R.A.S.C., T.F.), Capt. B. May (R.W.K.R.), contracted on active service, April 26th.

Lt. J. R. Taverner relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, April 26th.

Sec. Lt. (Hon. Lt.) C. B. Swanstone relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain the rank of Lt., April 26th.

Sec. Lt. E. Holt relinquishes his commn. on account of ill-health, and is permitted to retain his rank, April 27th.

The notification in "Gazette," April 1st, concerning Lt. H. Gray is cancelled.

Medical Branch.—The following are transferred to the unempld. list :—Capt. T. Gibbins, March 28th; Capt. J. Allen, April 3th; Capt. W. M. Jeffreys, April 6th; Capt. L. C. Blackstone, April 8th.

Memoranda.—Lt. J. S. Flanagan to be Hon. Capt., March 31st.

The following are transferred to the unempld. list :—Lt. (actg. Capt.) J. A. Heather, from (S.O.), Feb. 4th; Capt. (actg. Maj.) G. C. Gold, from (S.O.), Feb. 11th; Capt. G. B. Anderson, Feb. 12th; Capt. W. G. M. Crothers (Suff. R.), from (S.O.), Feb. 25th; Capt. S. T. Ravenscroft, from (S.O.), March 30th; Maj. W. C. Michie, O.B.E., from (S.O.), March 31st; Capt. (actg. Maj.) W. H. S. Garnett, from (S.O.), April 1st; Lt. T. Austin, from (S.O.), April 12th; Lt. (actg. Capt.) A. Keiller, from (S.O.), April 15th; Capt. (actg. Maj.) P. G. Edge, O.B.E., from (S.O.), April 21st.

ADMIRALTY APPOINTMENTS.

The following appointments have been made :—

April 26th.—Commrs.—Q. M. F. Stokes, D.S.O., to "Pegasus," in command, April 24th.

R.N.R.—Mids. (temp.).—A. E. Bye, to "Vindictive," April 25th.

THE CASUALTY LIST.

MILITARY.

Reported April 29th.

Released Prisoner from Germany arrived in England.—MacIntyre, Lt. D. H., Arg. and Suth'd Highrs., attd. R.F.C.

AIR FORCE.

Reported April 28th.

Previously Reported Missing, now Reported Killed.—Webster, Lt. J.

Previously Reported Missing, now Reported Died of Wounds.—Nunan, Sec. Lt. N. D.

Died of Injuries.—Hutton, Lt. W. D. C.; Minors, Capt. R. T.

Died.—McCulloch, Capt. R. C. S.; Patey, Capt. H. A.

Wounded.—Mackenzie, Lt. K. L.

Cadet.—Killed.—Craig, A. C.

PERSONAL NOTICES.

NAVAL.

Death.

BATCHELOR.—Major Thomas A. Batchelor, D.F.C., R.A.F. (late R.N.A.S.), was killed in a flying accident at Andover Aerodrome on April 22nd. He was the husband of Una Batchelor, Glenlyon, Alexandra Road, Andover, and was 32 years of age.

Major Batchelor was at one time serving with the R.N.A.S. at Dunkirk. In an attack on the lock-gates at Zeebrugge, he descended to within 500 ft. of his objective, which was very well defended. Although he and his observer were wounded and his machine was hit in many places, he landed his Handley Page safely at Dunkirk. For this gallant feat he was awarded the D.F.C. He also commanded a squadron of night-flying aeroplanes in France.

The "Daily Express" says :—

"When a paymaster in the Royal Naval Air Service he invented one of the best devices for teaching bomb-dropping. This device was a mirror on which were many parallel lines. The mirror was placed on the white target and the course of the bomber was watched in the mirror through a small eye-piece, and was followed by a little metal pointer moved by hand across the surface of the glass.

"When the observer in the air considered the target was in line with his bomb-sight he fired a coloured light, and immediately the instructor would cease moving the pointer. By examining the position on the cross-line the instructor could tell by how many yards short or over, right or left, of the objective the bomb would have fallen. This device was very reliable and was in great request for the training of bombers."

Birth.

MURRAY.—On April 17th, at the Eyrie, Radlett, Herts, to Dorothy, wife of Capt. L. E. R. Murray, R.A.F. (late R.N.A.S.)—a son.

MILITARY.

Death.

FENTON.—Sec. Lieut. Alan Hughes Fenton, R.F.C., who was previously reported missing is now known to have been killed in an aerial fight on March 4th, 1917. He was the only son of Mr. and Mrs. James Fenton, Oldfield, Worple Road, Wimbledon, and was 22 years of age.

Engagements.

LUKE—YOUNG.—An engagement is announced between Captain T. Carlyon Luke, M.C., R.E., attd. R.A.F., elder son of the late Mr. E. Arnest Luke and Mrs. Luke, late of Clevelands, Bere Alston, S. Devon, and Enid Isabel, younger daughter of J. B. Young, B.A., late Indian Educational Service, and Mrs. Young, of 7, Trinity Place, Eastbourne.

TEMPEST—BEST.—An engagement is announced between Major W. J. Tempest, D.S.O., M.C., R.A.F., son of Mr. W. F. Tempest, J.P., of Ackworth Grange, near Pontefract, Yorks, and Camille Millicent, elder daughter of Mme. C. M. Best and the late Mr. J. P. Best, of Brussels and Antwerp.

Marriage.

McEWEN—SMEATON.—At Shere Church, Surrey on April 23rd, a marriage took place between Captain Ian McEwen, 2nd Seaforth Highlanders and R.A.F., only son of Mr. John Forrester McEwen, of Villa Razzolini, Florence, and Miss Amethe Smeaton, daughter of the late Mr. Donald Smeaton, M.P., C.S.I. and Mrs. Smeaton, of Lawbrook, Gomshall. The Rev. F. C. Hill, rector of the parish, officiated, and the bride was given away by her brother-in-law, Colonel Monck-Mason.



AT NEWCASTLE: A "Super-Handley" getting off from the Exhibition Ground. "Rupert" is seen aloft in the back-ground.

LONGRIDGE—HOLLAND.—On April 23rd, at St. John Baptist, Knutsford, Captain Robert Begbie Longridge, 16th Lancers and R.A.F., younger son of R. Charles Longridge, was married to Alice Mary, only child of Captain the Honble. C. T. and Mrs. Holland, of Leamington, by the Rev. Wm. Armour and Canon T. J. Evans.

BIRTHS.

CHURCHMAN.—On April 27th, to Doris (née Greville), wife of Captain Allan Robert Churchman, D.F.C., R North Devon Hussars and R.A.F., of a daughter.

O'FARRELL.—On April 22nd, at 60, Fitzwilliam Square, Dublin, the wife of Major (act. Lieut.-Col.) E. H. O'Farrell, Royal Irish Fusiliers and R.A.F., of a son.

AIR FORCE

DEATHS.

HUNT.—Lieut. Hunt, R.A.F., whose home is at Richmond Valley, was killed as the result of a flying accident at Ford, Sussex, on April 23rd. Mr. Hunt had only just left Ford aerodrome and crossed the railway lines when he appeared to have engine trouble, and the machine was seen to crash in a field. When assistance arrived the officer was found to have sustained terrible injuries, and death must have been instantaneous.

PACE.—A motor-car accident, which occurred at Hanworth on April 26th, caused the death of Capt. Pace, D.F.C., R.A.F., and serious injury to three other officers. Capt. Face was in the car with Major Hazell, Major Lloyd, Capt. Lloyd, and Capt. Jackson, all of the R.A.F. The car was driven by Capt. Jackson over Queen's River Bridge, on the way to Hounslow Aerodrome, when the officer saw a dog in the road immediately ahead. He suddenly diverted the car to avoid the dog, a tyre burst, and the car turned completely over twice and was wrecked. All the officers except Major Lloyd, who luckily escaped with only scratches and bruises, were seriously injured. The officers were taken to St. Mary's Cottage Hospital, Hampton. Captain Pace died on the following morning.

MARRIAGES.

GRIFFITH—PARKINSON.—On April 21st, at Witney Parish Church, Capt. Edward Noel G. Griffith, R.A.F., son of Col. and Mrs. Griffith, Deanwood House, Cheltenham, was married to Maude Lyle (Bluebell), widow of Lieut. Reay Parkinson, R.N., only daughter of Capt. Hooper, Bishop's Stortford.

KELLY—D'ARENBERG.—On April 26th, at Bramshott Church, Captain Ignatius George Kelly, R.A.F., eldest son of the late David Frederic Kelly, Professor of Classics in Adelaide University, was married to Elia Francis, younger daughter of the late Arthur William d'Arenberg, Esq., by the Rev. Hugh B. Chapman, M.A., Chaplain of the Chapel Royal, Savoy, assisted by the Rev. E. H. Polehampton, M.A., Rector of the Parish.

MANGHAM-HESELTINE.—On April 14th, at St. Mary's, Balham, Lieut. Frank Roland Mangham, R.A.F., twin son of Harry Mangham, Esq., B.A., and Mrs. L. Mangham, was married to Elsie Maud Heseltine, eldest daughter of the late W. J. Heseltine, Esq., and Mrs. Heseltine.

MELHUISH—HAILL.—On April 23rd, at St. Giles's, Camberwell, Lieut. Percy A. Melhuish, R.A.F., younger son of Mr. and Mrs. A. E. Melhuish, of The Cottage, Purley, was married to Mildred May, daughter of the late E. R. Haill, and Mrs. Haill, The Bank House, New Kent Road, S.E., by the Rev. C. W. Litting, Vicar of St. Luke's, Hornsey.

BIRTHS.

ANDERSON.—On April 22nd, at a nursing home, the wife of John Anderson, R.A.F., of St. Margaret's, Broomfield Avenue, Palmer's Green—a daughter.

GOLDSWORTHY.—On Easter Day, at Ballymore, Camolin, the wife of Lieut. E. C. Goldsworthy, R.A.F., of a son.

ROBERTS.—On April 18th, at 34, Albert Road, Regent's Park, the wife of Major E. J. Cyril Roberts, R.A.F., of a daughter.

* * *

Members of 41 Squadron R.A.F. are earnestly requested to communicate to G. Herbert Martin, Esq., 3908 Dewdney Avenue, Regina, Sask., Canada, any information available concerning the fate of Lieut. F. M. H. Mar in, R.A.F., of 41 Squadron. He was reported missing on Aug. 9th, 1918. No information has reached his father since that date, and his parents are anxious to hear from anybody who knew him in the Squadron, or could tell them anything whatever regarding his disappearance, or who knew of the work he had done in the R.A.F. His last letter home was dated July 28th, and, naturally, his people desire very much to have news of his doings, and will be most grateful to anybody who will communicate with them.

* * *

Lieut. W. F. Mars, R.A.F., who left an aerodrome in Belgium on Tuesday last, April 22nd, has not been heard of since, and all efforts to trace him have failed.

He has been in the Royal Air Force for two years, and was considered a good pilot. It is thought that, during the stormy weather of the past week, he may have been driven out to sea, and have been picked up by a trawler or passing ship.

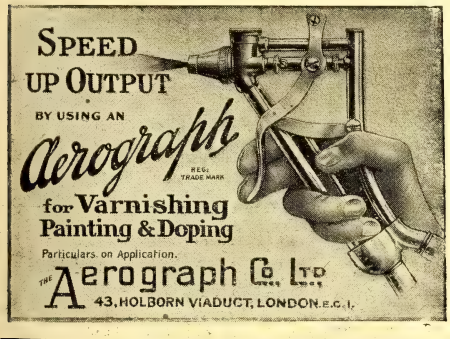
Any persons able to give information of the missing aviator are requested to communicate with his mother, Mrs. Mars, 32, Mowbray Road, Brondesbury, N.W.

* * *

An aeroplane piloted by Capt. Bowen, R.A.F., with Lieut. Alcock, R.A.F., as observer, was seen to be in distress while flying over Galway on April 22nd. The aeroplane managed to get over Galway Bay when the engine stopped. The machine then turned a somersault in mid-air, and dived nose first into the water. The observer jumped clear, but the pilot was unable to extricate himself in time, and was carried underneath the waves by the falling aeroplane. With difficulty he managed to scramble out, and joined his observer in a twenty-five yards' swim to the shore, which they reached in safety before a boat dispatched from the Naval Base immediately the mishap was observed, could arrive on the scene.

* * *

108th Sqd., R.A.F.—Any information concerning Lieut. C. A. Featherstone (pilot) and Sec. Lieut. F. Ovens (observer) will be gratefully received by Mr. Featherstone (Trinity House Pilot),



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The Nest, Stanley Road, Deal, Kent. The two officers were flying D.H.9 D.7342 and were seen to come down under control west of Roulers on Oct. 1st, 1918, when returning from a raid.

ATHLETICS IN THE R.A.F.

The programme on April 19th in the R.A.F. sports tournament in France consisted of the semi-final ties in the two football competitions.

At Rugby football the Engine Repair Shops beat 9th Brigade by 1 goal and 1 try (8 points) to 1 penalty goal and 1 try (6 points), and the 2nd Brigade beat No. 1 A.S.D. by 6 goals, 3 dropped goals, and 4 tries (54 points) to nothing.

At Association football the 2nd Brigade beat the 9th Brigade by 4 goals to 3, after extra time; and the Engine Repair Shops beat Headquarters by 5 goals to 1.

RUGBY FOOTBALL.

On Saturday, April 19th, Llanelly beat the R.A.F., at Llanelly, by 13 points to 10 points.

Swansea beat the Royal Air Force, at Swansea, on April 26th by 1 try (3 points) to nothing.

SWEDISH MILITARY TRIALS.

The Swedish Government acceded on April 25th to the request of the British Government for permission for two large British aeroplanes to enter Sweden to compete in some military trials.

AUSTRALIAN AERIAL DEFENCE.

It is now stated that the British Government is supporting the scheme of Australian Aerial Defence projected by the Commonwealth Government, and is offering as a gift one hundred quite modern aeroplanes to Australia. Four air stations will be established as soon as practicable, and the conditions of service and pay proposed are attractive.

A U.S. NAVAL FLIGHT.

On April 26th the seaplane F5 (?F-5-L), with a crew of four naval fliers, made a duration flight which is claimed by the Americans as a world's record. The machine started from Norfolk, Virginia, and flew for 20 hrs 10 mins., covering a distance of 1,250 miles. Her crew consisted of Lieut.-Comdr. H. B. Crow and Ensigns Delos, T. R. F. Souther, and Irvine. She had two Liberty engines. The crew claim to have travelled 2,000 miles, but this is unofficial, as indeed is the whole story.

AN AMERICAN FLIGHT.

It was recently announced in America that Major T. C. Macauley, U.S.A., A.S., had flown from San Diego, California, to Jacksonville, Florida, and back to Fort Worth, Texas, a distance of 5,500 miles, in 44 hours and 15 minutes actual flying time. Frequent stops were made en route.—[In "dry" territory, one hopes.—Ed.]

COLONIAL CADETS.

To the Editor of THE AEROPLANE.

Sir,—I am a flight cadet, a Colonial, and, therefore, a totally insignificant personality in the R.A.F. The foregoing will apprise you of the fact that I have a grouse to air.

If General Seely's word can be taken I was to get a temp. commission as from Feb. 12th, 1919, a £50 kit grant, and a first-class passage home. Need I say that these desirable conditions have not come into effect?

I graduated early in February "A," "B" and "C," and am wearing wings, but, when I applied for full flying pay (8s. per day), to which I became entitled on graduation, I was informed that 4s. per day was the full rate for a cadet, and they want to know when I ceased flying, in order that even the 4s. might be knocked off, leaving me with 7s. 6d. on which to live as an officer in a mess the other members of which draw three times my pay!

Probably I shall be sent home very shortly in the steerage—perhaps I should be delighted to get a passage in a cattle boat if it would get me away from the R.A.F. quicker, but that does not make the conduct of the Air Force Authorities any more justifiable.

J. R. L.

SELECTION OF FLYING MEN.

The following letter appeared in the "Times":—

Sir,—You have repeatedly pointed out in your columns that civil aviation must be made as safe as possible. Now there are three chief risks in aviation:—

1. Weather conditions, especially fogs and storms.
2. Mechanical defects in the machine.
3. Physical defects of the pilot.

There are, unfortunately, at the present moment no reliable data by which we can estimate flying risks, but there can be no doubt from the experience gained during the war that the physical condition of the pilot is of the greatest importance in minimising the risks of flying.

Pilots are now presenting themselves to insurance companies for civil aviation, having previously been employed in the Air Force. They are asked how many hours they have flown and whether they have had "crashes," and whether they feel fit at the present moment.

If they have had any "crashes" the premium is raised. No medical certificate is required as to the condition of the airman when he becomes insured; he may be quite unfit for flight, and all medical officers engaged in the examination of flying men would agree that little reliance can be placed on the opinion of the pilot himself with regard to his fitness.

It seems to me that the present haphazard selection of flying men is a great danger to the public and cannot be allowed to continue. The ordinary physical examination by which organic disease can be excluded is not sufficient; specific attention must be given to the functional efficiency of, for instance, the nervous system and cardiac-vascular system. Then again one examination is of little use; in three or four months' time the man may be quite unfit for flight.

There must therefore be periodic re-examination if civilian flying is to be a safe pursuit. The examination of entrants to the Air Force was thought by some to be absurdly severe, but, as a matter of fact, when the standards of fitness were applied to pilots of some experience, the quality of fitness demanded was found to be by no means too high. The public must look to the Air Ministry for a definite plan of action which will, as far as possible, ensure their safety. Yours faithfully,

H. RONALD CARTER, late Captain, R.A.F.,
Kensington. Member of Aviation Candidates' Medical Board.

LORD WEIR ON INDIVIDUAL ENTERPRISE.

Lord Weir, speaking at Glasgow on Thursday evening, at a staff dinner of William Beardmore and Co., Ltd., said that he disagreed with those who contended that the Ministry of Munitions represented the greatest Socialistic enterprise ever undertaken, and that its success justified a fuller extension of State control and nationalisation of industry during peace time. He did not think a greater fallacy was ever conceived, in so far as the Ministry adhered to its policy of offering opportunities to, and to a certain extent assisting, manufacturers to realise their opportunities.

Success was achieved, but as a rule failure resulted from attempting to show industries how to do their own business. We went to war and beat the enemy because we gave full play, more or less, to individual enterprise against an enemy who fed his industries through a Government spoon and choked them at the finish.

JOY RIDING ON A LORRY.

Four young airmen stationed at Duxford were charged at Cambridge on April 25th with stealing an Army lorry. It was alleged that they drove away in it on Sunday morning and went to the Norfolk coast, stopping at Snettisham, near Hunstanton, where they got into difficulties through the lorry wheels digging themselves into the shingle.

They got the lorry on the road again on Monday morning but excited the suspicions of the police, who made inquiries. On Tuesday a police sergeant and a special constable jumped in the lorry to arrest them. But the airmen put them out of the car and drove to Fakenham and Denver. A cordon was drawn round the district by telephone, and the party were eventually arrested and conveyed to Cambridge.

The accused are First Airman Charles Brier Adams, 22, Second Airman Henry Beddard, 20, First Airman David Watson Armstrong, 20, and Second Airman John William Martindale, 20.

Martindale is alleged to have admitted to the officer who arrested him that they stole the lorry, and in excuse for escaping from the police at Snettisham said that the sergeant interfered with his driving, whereupon they put him out.

TO CANADIAN AVIATORS.

Canadians of all ranks in the R.A.F. who are interested in co-operation for military, commercial, and social purposes on their return to Canada are invited to write to "Canfly," c/o THE AEROPLANE, 166, Piccadilly, W.1, giving their names and addresses.

As stated last week, this has nothing to do with an employment agency, nor is it concerned with a register of pilots. It is merely an effort on the part of a Canadian officer, who is returning to Canada, to keep Canadian aviators in touch with developments and with one another.

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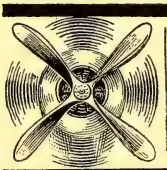
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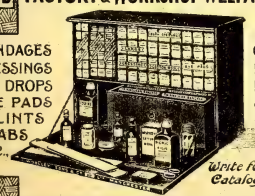
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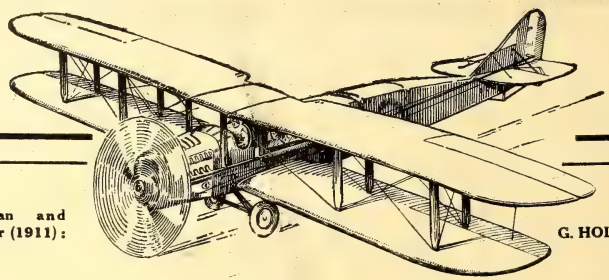
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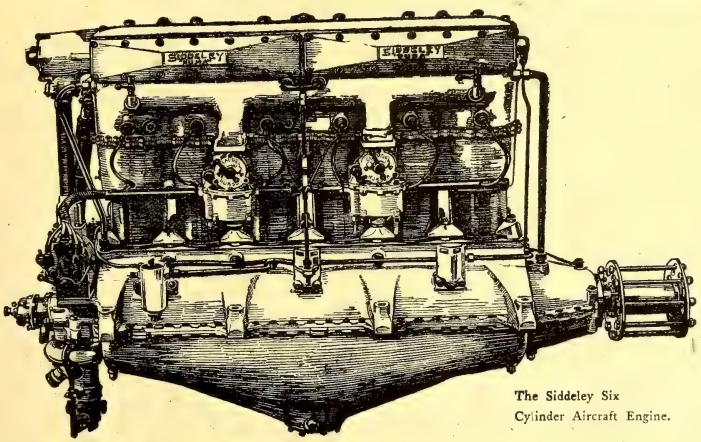
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ON THE REGULATION OF CIVIL AVIATION IN THE BRITISH ISLES.

(PART I.)

On April 29th there was issued to the Press for publication on April 30th the long-attended "Order of The Secretary of State Under The Air Navigation Acts, 1911 to 1919," governing Civil Aviation within the British Isles. This appeared in the usual form of a Supplement to the "London Gazette" dated Wednesday, April 20th.

Simultaneously the Air Ministry issued a pamphlet entitled "Air Navigation Directions I," explaining quite lucidly the correct course to be followed by those affected by the Order aforementioned in obeying the various regulations.

Both documents may be had from stationers, booksellers, and the usual Government publishers, and all who are concerned with Civil Aviation are advised to keep copies by them for reference. At the same time it seems advisable to publish both documents in this paper simultaneously—though in serial form—so that those who are not so immediately affected by the Regulations as to need to have the documents constantly with them may be informed as to their contents.

One proposes throughout, for the sake of brevity and clearness, to refer to the Order Under the Air Navigation Act as the "Regulations" and to the explanatory Air Navigation Direction simply as the "Directions." The scheme which one proposes to follow is to give a section of the Regulations and to place immediately after it the section of the Directions which refers to it. Thereafter one will add a few comments where they may appear necessary.

As the Regulations are obviously subject to modification according to the experiences of those practising civilian flying, readers are cordially invited to criticise both the Regulations and the Directions, for such criticism is likely to be of interest and of use to the Air Ministry in framing future Air Laws. Such criticisms, if rational and likely to be useful, will be published in this paper for the enlightenment of the aeronautical community.

Let it be said as a preliminary remark that as they stand the Regulations and the Directions appear to be eminently reasonable. But the good or evil of Laws depend not so much in the laws themselves as in the application thereof. One's chief fear is lest aviation should be hampered by evil or foolish Government officials who may misconstrue these Regulations either to suit their own ends or because of their lack of sense.

Now that the actual fighting on the Continent is over one fears that we who are concerned with aircraft may find ourselves engaged in a Civil Aviation War no less bitter than that which was waged against the other Teutonic tribes. But that is another matter, which will come in its own bad time. For the present let us to our Regulations and Directions.

THE AIR REGULATIONS.

Here follows the text of the Regulations, as published officially:—

From the "London Gazette" of Wednesday, April 30th, 1919.
AIR MINISTRY, APRIL 30TH, 1919.

AIR NAVIGATION REGULATIONS, 1919.

ARRANGEMENT OF REGULATIONS.

REGULATION.
1. General conditions of flying.
2. Additional conditions in certain cases.
3. Reference to schedules.
4. Aerodromes.
5. General safety provisions.
6. Production of licences, certificates and log books for inspection.
7. Right of inspection of and access to aerodromes and factories.
8. Exceptions.
9. Foreign aircraft.
10. Penalties.
11. Power to cancel or suspend licences and certificates.
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14. Short title.

SCHEDULES.
I.—Registration of aircraft.
II.—Licensing of personnel.
III.—Certificates of airworthiness for passenger aircraft and periodical overhaul and examination of such aircraft.
IV.—Registration and nationality marks.
V.—Log books.
VI.—Prohibited areas.
VII.—Rules as to lights and signals and rules of the air.
VIII.—Rules as to aircraft arriving in or departing from the United Kingdom.

Order of the Secretary of State under the Air Navigation Acts, 1911 to 1919.

In pursuance of the powers conferred upon me by the Air Navigation Acts, 1911 to 1919, and all other powers enabling me in that behalf, I, the Right Honourable Winston Spencer Churchill, one of His Majesty's Principal Secretaries of State, by order make the following regulations:—

GENERAL CONDITIONS OF FLYING.

1. No aircraft shall fly within the limits of the British Islands and the territorial waters adjacent thereto unless the following conditions are complied with:—

(1) The aircraft shall be registered in the prescribed manner:

(2) The aircraft shall bear the prescribed registration and nationality marks, affixed or painted on the aircraft in the prescribed manner:

(3) The personnel of the aircraft shall be licensed in the prescribed manner:

(4) There shall be carried in the aircraft—

(a) the certificate of registration; and

(b) the licence of any member of the personnel who is required to be licensed:

(5) The provisions of these regulations as to general safety, and the rules as to lights and signals and rules of the air, as set out in these regulations, shall be duly complied with:

(6) No mails shall be carried without the consent in writing of the Postmaster-General, and no wireless apparatus shall be installed or worked except under and in accordance with a licence granted by the Postmaster-General, containing such conditions as may be approved by the Secretary of State:

(7) The aircraft shall not fly over any prohibited area as defined by these regulations;

Provided that—

(a) the requirements of this regulation as to registration and as to the bearing of registration and nationality marks, shall not apply to aircraft built for the purpose of experiment, and flown for the purpose of experiment or test only within three miles of an aerodrome or aircraft factory or in accordance with such directions (if any) as may be given by the Secretary of State; and

(b) the requirements of this regulation as to licensing of personnel shall not apply within the precincts of an aerodrome in the case of personnel under instruction or of aircraft flying for experimental purposes.

ADDITIONAL CONDITIONS IN CERTAIN CASES.

2. Without prejudice to the last foregoing regulation—

(1) A passenger aircraft carrying passengers shall not—

(a) fly within the limits aforesaid unless it has been certified in the prescribed manner as airworthy, and the prescribed conditions as to airworthiness, periodical overhaul, and examination before each flight are complied with, and all the prescribed certificates in relation to airworthiness are carried in the aircraft; or

(b) use as a regular place of departure or place of landing any place other than a licensed aerodrome, or a Royal Air Force aerodrome or aerodrome under the control of the Secretary of State approved for the purpose by the Secretary of State:

(2) A passenger or goods aircraft shall not fly within the limits aforesaid unless there are carried in the aircraft the prescribed log books, accurately kept up to date in the prescribed form and manner:

(3) An aircraft arriving in or departing from the United Kingdom shall comply with the provisions of these regulations applicable to such a case.

REFERENCE TO SCHEDULE.

3.—(1) The provisions in the schedules to those regulations shall have effect as part of these regulations, and shall be duly observed by all persons concerned in the cases to which they relate, that is to say:—

Schedule.	Subject matter.
I	Registration of aircraft.
II	Licensing of personnel.
III	Certificates of airworthiness for passenger aircraft, and periodical overhaul and examination of such aircraft.
IV	Registration and nationality marks.
V	Log books.
VI	Prohibited areas.
VII	Rules as to lights and signals and rules of the air.
VIII	Rules as to aircraft arriving in or departing from the United Kingdom.

(2) The Secretary of State may, if he thinks fit, issue directions for the purpose of supplementing or giving full effect to the provisions of the above schedules, or for any purpose for which provision is under these regulations to be made by direction of the Secretary of State.

AERODROMES.

4.—(1) No place in the British Islands shall be used as an aerodrome or as a regular place of landing or departure by passenger aircraft carrying passengers, unless it has been licensed for the purpose by the Secretary of State, and any conditions of such licence are complied with.

(2) There shall be kept exhibited in a conspicuous place at all aerodromes used for the landing or departure of passenger or goods aircraft, a tariff of charges in such form and on such scale as may be directed or approved by the Secretary of State.

(3) In the case of any contravention of or failure to comply with this regulation, the proprietor of the aerodrome shall be deemed to have acted in contravention of or, as the case may be, failed to comply with these regulations.

(4) This regulation shall not apply to Royal Air Force aerodromes or aerodromes under the control of the Secretary of State, the use of which has been sanctioned by the Secretary of State; provided that any directions of the Secretary of State as to the use of such aerodromes are complied with.

GENERAL SAFETY PROVISIONS.

5.—(1) An aircraft shall not fly over any city or town except at such altitude as will enable the aircraft to land outside the city or town should the means of propulsion fail through mechanical breakdown or other cause;

Provided that this prohibition shall not apply to any area comprised within a circle with a radius of one mile from the centre of a licensed aerodrome or of a Royal Air Force aerodrome, or of an aerodrome under the control of the Secretary of State.

(2) No person in any aircraft shall—

(a) carry out any trick flying or exhibition flying over any city or town area or populous district; or

(b) carry out any trick flying or exhibition flying over any regatta, race meeting, or meeting for public games or sports, except where specially arranged for in writing by the promoters of such regatta or meeting; or

(c) carry out any flying which by reason of low altitude or proximity to persons or dwellings is dangerous to public safety; or

(d) drop or cause or permit to be dropped, from the aircraft any article except ballast as authorised by the rules of the air as set out in these regulations.

PRODUCTION OF LICENCES, CERTIFICATES AND LOG-BOOKS FOR INSPECTION.

6.—(1) Any member of the personnel of an aircraft shall on demand produce his licence for the inspection of any persons authorised for the purpose by the Secretary of State.

(2) The owner and person in charge of any aircraft shall, on demand, produce for the inspection of any person authorised for the purpose by the Secretary of State, any certificates or licences relating to the aircraft, and also, in the case of passenger or goods aircraft, any of the prescribed log-books.

RIGHT OF INSPECTION OF AND ACCESS TO AERODROMES AND FACTORIES.

7.—(1) Any person authorised by the Secretary of State for the purpose shall have the right of access at all reasonable times to any aerodrome for the purpose of inspecting the same, or to any place to which access is necessary for the purpose of carrying out his powers and duties under these regulations.

(2) All aircraft belonging to or employed in the service of His Majesty shall have at all reasonable times the right of access to any licensed aerodrome.

(3) During the construction of a passenger aircraft any person authorised by the Secretary of State shall at all times during working hours have the right of access, for purposes of inspection, to that portion of the shops in which parts are being manufactured or assembled, and to drawings of the parts under inspection, whether at the works of the main contractor or of sub-contractors.

EXCEPTIONS.

8. These regulations do not, except where otherwise expressly stated, apply—

(a) to military aircraft belonging to or employed in the service of his Majesty; or

(b) to any aircraft or to any persons if and to such extent as such aircraft or persons may be excepted from these regulations, or any of them, by direction of the Secretary of State on the recommendation of a Government Department.

FOREIGN AIRCRAFT.

9. The provisions of these regulations as to—

(a) registration of aircraft;
(b) licensing of personnel;
(c) airworthiness;
(d) log books; and
(e) wireless apparatus;

shall not apply to foreign aircraft:

Provided that—

(i) no foreign military aircraft shall fly over or land in the British Islands or the territorial waters adjacent thereto except on the express invitation or with the express permission of His Majesty or of a Government Department, but any such aircraft landing on such invitation or with such permission shall be exempt from these regulations to such extent and on such conditions as may be specified in the invitation or permission; and

(ii) where any foreign aircraft, after first landing in the British Islands, flies over any part thereof except in such manner as may be necessary in order to proceed to a foreign destination, all the provisions of these regulations shall apply to that aircraft unless there are carried in the aircraft, and produced for inspection as and when required by the Secretary of State, certificates, licences, and log books issued by the responsible authority in the country to which the aircraft belongs, complying substantially with the provisions of these regulations, and unless (in the case of a passenger aircraft) the conditions of the aircraft from the point of view of the safety of the passengers and personnel correspond substantially with the particulars contained in the certificates produced.

PENALTIES.

10.—(1) Where any aircraft flies in contravention of, or fails to comply with, these regulations or any provision thereof, the owner of the aircraft, and also the pilot or commander, shall be deemed to have contravened or, as the case may be, failed to comply with these regulations:

Provided that it shall be a good defence to any proceedings for contravention or failure to comply with these regulations if the contravention or failure is proved to have been due to stress of weather or other unavoidable cause.

(2) If any person obstructs or impedes any person acting under the authority of the Secretary of State in the exercise of his powers and duties under these regulations, such first-mentioned person shall be deemed to have acted in contravention of these regulations,

(3) Any person contravening or failing to comply with these regulations or any provision thereof is liable to imprisonment for a term not exceeding six months or to a fine not exceeding two hundred pounds, or to both such imprisonment and fine.

(4) Any aircraft which flies or attempts to fly over a prohibited area is liable to be fired on in accordance with section two of the Aerial Navigation Act, 1913, and the provisions of these regulations relating thereto.

(5) If any person in any aircraft is guilty of any act of espionage to which the provisions of section one of the Official Secrets Act, 1911, apply, he is liable to penal servitude for a term not exceeding seven years.

Power to Cancel or Suspend Licences and Certificates.

11.—(1) The licence of any member of the personnel of an aircraft, or the licence of any aerodrome, may be cancelled or suspended by the Secretary of State on sufficient ground being shown to his satisfaction, after due inquiry, and his decision shall be final:

Provided that in special cases the Secretary of State may suspend any such licence temporarily and provisionally pending the holding of an inquiry.

(2) Any certificate relating to the airworthiness of an aircraft may be cancelled or suspended by the Secretary of State if he is satisfied that reasonable doubt exists as to the safety of the aircraft in question, or of the type to which the aircraft in question belongs.

(3) Where any person is convicted of any contravention or failure to comply with these regulations in respect of any aircraft, the Secretary of State may cancel or suspend the certificate of registration of that aircraft.

Interpretation.

12. In these regulations, unless the context otherwise requires—

"Aircraft" includes airships and flying machines, all balloons, whether fixed or free, and kites;

"Airship" means an aircraft lighter than air and having means of propulsion;

"Balloon" means an aircraft lighter than air and having no means of propulsion;

"Flying machine" includes aeroplanes, seaplanes, flying boats, and other flying machines heavier than air and having means of propulsion;

"Military aircraft" includes naval, military, and Air Force aircraft;

"Passenger aircraft" and "goods aircraft" means respectively aircraft intended for carrying passengers or goods (including mails), for hire or reward, and include respectively aircraft on which passengers or goods are actually so carried;

"Personnel" (in relation to any aircraft) includes any pilot, commander, navigator, and engineer, and any operative member of the crew;

"Aerodrome" means any definite and limited ground or water area intended to be used and capable of being used, either wholly or in part, for the landing or departure of aircraft;

"Proprietor of an aerodrome" includes any person responsible for the management thereof;

"Licensed aerodrome" means an aerodrome licensed under these regulations;

"Prescribed" means prescribed by these regulations or by directions of the Secretary of State thereunder;

"Prohibited area" means any of the areas referred to in Schedule VI. of these regulations;

"Secretary of State" includes, in relation to any purpose of these regulations, any person authorised by the Secretary of State for that purpose.

The Interpretation Act, 1889, applies for the purpose of the interpretation of these regulations as it applies for the purpose of the interpretation of an Act of Parliament, and as if these regulations were an Act of Parliament.

Saving.

13. Nothing in these regulations shall be construed as conferring any right to land in any place as against the owner of the land or other persons interested therein, or as prejudicing the rights or remedies of any person in respect of any injury to persons or property caused by any aircraft.

Short Title.

14. These regulations may be cited as the Air Navigation Regulations, 1919.

WINSTON S. CHURCHILL,
One of His Majesty's Principal
Secretaries of State.

Air Ministry, London, April 30th, 1919.

So far as the matter of passenger-carrying and mail-carrying machines is concerned it hardly seems that anyone can have any serious quarrel with these Regulations. But there would appear to be a good deal of doubt about the position of private pilots, their aerodromes, and their passengers. The Regulations throughout seem to refer to pilots and machines carrying passengers for hire or reward. If they refer to private flying, then certain of the Regulations—as for example the licensing and inspection of aerodromes—are an interference with the liberty of the subject. If they do not refer to private flying then undue liberty is given to the private aviator, who, it seems, might loop down Piccadilly or loop round the Tower Bridge to the danger of the British Public without let or hindrance.

However, let us now proceed to the Schedules, which, unlike the first part of the Regulations, involve reference to the Directions:—



A Photograph of typical country in the neighbourhood of Gouda, Holland, taken from a Dutch Military Aeroplane, and published by courtesy of the Dutch Military Authorities.

THE SCHEDULES.

SCHEDULE I.

REGISTRATION OF AIRCRAFT.

1. Certificates of registration shall be granted by the Secretary of State, and upon registration there shall be assigned to the registered aircraft a registration mark.

2. The applicant, unless the Secretary of State in special cases otherwise allows, must be a British subject, or in the case of a body corporate must be registered and have its principal place of business in the United Kingdom.

3. Application for registration shall be made to the Secretary, Air Ministry.

4. The fee to be charged for registration will be one guinea.

5. Upon any change of ownership of registered aircraft, the certificate of registration shall lapse, but a fresh certificate may be applied for by the new owner.

The Directions are introduced by a short preliminary paragraph which, together with the Directions relating to Schedule I, reads as follows :—

AIR NAVIGATION DIRECTIONS I.
Air Navigation Acts, 1911-1919.

DIRECTIONS.

The Air Navigation Regulations, 1919, recently issued, provide for the issue of supplementary "Directions" as may be necessary, and the following Directions are accordingly notified for the information of all concerned :—

I.—REGISTRATION OF AIRCRAFT.

1. With reference to Regulations 1 (1) and Schedule I, applications for registration should be made to the Secretary, Air Ministry, London, W.C.2.

2. Application forms will be supplied on demand.

This calls for no comment, so we may now pass to Schedule II of the Regulations :—

SCHEDULE II.
Licensing of Personnel.

LICENSING AUTHORITY.

1. Licences shall be granted by the Secretary of State. Applications therefor shall be made to the Secretary, Air Ministry.

PILOTS.

2. A person applying for a pilot's licence to fly passenger or goods aircraft will be required to—

(a) pass a medical examination carried out under the control of the Secretary of State;

(b) produce a certificate of competency issued by the Secretary of State, or be qualified as a Royal Air Force pilot;

(c) submit proof of recent reasonable flying experience on the class of machine for which the licence is required, or failing such proof undergo practical tests.

3. A person applying for a pilot's licence to fly machines other than passenger or goods aircraft must either be qualified as a Royal Air Force pilot, or produce a certificate of competency issued by the Secretary of State.

NAVIGATORS.

4. A person applying for a licence to navigate passenger or goods aircraft will be required to—

(a) pass a medical examination carried out under the control of the Secretary of State;

(b) produce a certificate of competency issued by the Secretary of State.

ENGINEERS.

5. A person applying for a licence to be engaged as engineer on passenger or goods aircraft will be required to—

(a) pass a medical examination carried out under the control of the Secretary of State;

(b) submit proof of sufficient knowledge and experience in the management of aircraft engines;

(c) undergo, if necessary, practical and theoretical tests.

OTHER PERSONS.

6. Persons applying for a licence in any other capacity than those above specified must comply with such conditions as may be directed by the Secretary of State.

GENERAL.

7. Holders of licences may be required from time to time to undergo furtther medical examination carried out under the control of the Secretary of State.

8. Licences shall remain valid for the following periods :—

Pilots' licences ..... 6 months
Other licences ..... 12 months

and shall not be valid unless endorsed by the Secretary of State at those intervals.

9. The fee to be charged in respect of each licence issued and in respect of each such endorsement as aforesaid shall be five shillings.

In the event of any applicant being required to undergo such practical test as is specified in paragraphs 2 (c) and 5 (c) above, a further fee of one guinea will be charged.

Here again the Regulations seem reasonable. Though pilots may feel aggrieved at having to renew their licences every six months, it is in the interests of aviation that it should be so, for in no other way can a check be kept on the depreciation of a pilot's nerve, or on his behaviour as a public servant.

The Directions concerning this Schedule are of considerable interest :—

II.—LICENSING OF PERSONNEL.

1. With reference to Regulations 1 (3) and Schedule II, applications for licences should be made to the Secretary, Air Ministry, London, W.C.2.

2. Any member of the personnel of an aircraft, other than those specifically mentioned in Schedule II, can obtain on application to the Secretary, Air Ministry, particulars of the requirements for obtaining a licence.

3. Application forms will be supplied on demand.

Medical Requirements.

4. Every applicant before obtaining a licence as a pilot, navigator, or engineer of aircraft engaged in public transport will present himself for examination by specially qualified men appointed by or acting under the authority of the Secretary of State.

5. Medical supervision, both for the selection and the maintenance of efficiency, shall be based upon the following requirements of mental and physical fitness :—

(*a*) Good family and personal history, with particular reference to nervous stability. Absence of any mental, moral, or physical defect which will interfere with flying efficiency.

(*b*) MINIMUM AGE for pilots and navigators engaged in public transport shall be nineteen (19) years.

(*c*) GENERAL SURGICAL EXAMINATION.—The applicant must neither suffer from any wound, injury, or operation, nor possess any abnormality, congenital or otherwise, which will interfere with the efficient and safe handling of aircraft.

(*d*) GENERAL MEDICAL EXAMINATION.—The applicant must not suffer from any disease or disability that renders him liable suddenly to become incompetent in the management of aircraft. He must possess heart, lungs, kidneys, and nervous system capable of withstanding the effects of altitude and also the effects of prolonged flight.

(*e*) EYE EXAMINATION.—The applicant must possess a degree of visual acuity compatible with the efficient performance of his duties. No pilot or navigator shall have more than two (2) dioptres of latent hypermetropia; muscle balance must be good and commensurate with the refraction. He must have a good field of vision in each eye and must possess normal colour perception.

(*f*) EAR EXAMINATION.—The middle ear must be healthy. The applicant must possess a degree of auditory acuity compatible with the efficient performance of his duties.

(*g*) The vestibular mechanism must be intact, and neither unduly hypersensitive nor hypnosensitive.

(*h*) NOSE AND THROAT EXAMINATION.—The applicant must possess free nasal entry on either side, and not suffer from serious acute or chronic affections of the upper respiratory tract.

6. The successful applicant will receive a medical certificate of acceptance, which must be produced before the licence can be issued.

7. In order to insure the maintenance of efficiency, every applicant shall be re-examined periodically, at least every six months, and the findings attached to his original record. In case of illness or accident, also, a pilot, navigator, or engineer shall be re-examined and pronounced fit before resuming aerial duties. The date and result of each re-examination shall be recorded on the applicant's flying certificates.

8. No applicant who, before May 1st, 1919 has given proof of his flying ability shall, so long as he retains such ability, be necessarily disqualified because he fails to fulfil all of the above requirements.

9. Applications for medical examination should be made to the Secretary, Air Ministry, London, W.C.2.

Flying Certificates.

10. CERTIFICATES FOR PILOTS OF FLYING MACHINES :—

"A" Flying Certificate for private pilots (not valid for flying passenger or goods aircraft).

"B" Pilot's Flying Certificate for flying passenger or goods aircraft.

"A" Private Pilot's Flying Certificate.

(1) PRACTICAL TESTS.

In each practical test the candidate must be alone in the flying machine.

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(*a*) Test for Altitude and Gliding Flight.—A flight without landing, during which the pilot shall remain for at least an hour at a minimum altitude of 6,000 feet above the point of departure. The descent shall finish with a glide, the engines cut off at 4,500 feet above the landing ground. The landing shall be made within 150 yards or less of a point fixed beforehand by the official examiners of the test without starting the engine again.

(*b*) Tests of Skill.—A flight without landing around two posts (or buoys) situated 500 yards apart, making a series of five figure-of-eight turns, each turn reaching one of the two posts (or buoys). This flight shall be made at an altitude of not more than 600 feet above the ground (or water) without touching the ground (or water). The landing shall be effected by :—

(i) Finally shutting off the engine or engines at latest when the aircraft touches the ground (or water).

(ii) Finally stopping the flying machine within a distance of 50 yards from a point fixed by the candidate before starting.

(II) Technical Examination.

(*a*) Rules as to lights and signals, and rules of the air.

(*b*) Rules for aerial traffic in the vicinity of aerodromes.

"B" Pilot's Flying Certificate for Flying Passenger or Goods Aircraft.

Goods Aircraft.

(I) Practical Tests.

In each practical test the candidate must be alone in the flying machine.

(*a*) The tests for altitude and gliding flight and for skill are the same as those required for a private pilot's Flying Certificate. Candidates already in possession of the latter certificate are not required to pass these tests again.

(*b*) Test of Endurance.—A cross-country or oversea flight of at least 200 miles, and the final landing shall be made at the point of departure.

This flight shall be carried out by the same aircraft within eight hours, and include two obligatory landings, during which the machine must come to rest, which shall not be at the point of departure, but shall be fixed by the judges.

At the time of departure the candidate shall be informed of his course and furnished with a map. The judges will decide if the course has been correctly followed.

(*c*) Night Flight.—A thirty minutes' flight at an altitude of at least 1,500 feet, made between two hours after sunset and two hours before sunrise.

(II) Technical Examination.

After satisfactory practical tests have been passed, candidates will submit themselves when summoned to examination on :—

(*a*) Flying machines.

(*b*) Engines.

(*c*) Navigation.

(*a*) Flying Machines.

Aeroplanes and Seaplanes.—Theoretical abstract knowledge of the resistance of the air in connection with planes, rudders, elevators, and propellers; functions of the different parts of the machine and their controls.

Assembling of aeroplanes, propellers, undercarriages, rudders, elevators and their controls.

Practical tests on rigging.

(*b*) Engines.

General knowledge of internal combustion engines, and their various functions; valve gear, carburation, ignition, exhaust.

Characteristics of aero-engines and a general idea of their construction, adjustment, and assembling.

Causes of the faulty running of engines. Fuel and oils. Description of the details of the aero-engines used. Adjustments, lubrication, upkeep, dissembling and assembling of the principal parts; causes of breakdown. Use of throttle and other controls.

Practical tests in running repairs.

(*c*) Navigation.

Knowledge of rules as to lights and signals, rules of the air, and rules for aerial traffic in the vicinity of aerodromes.

Practical knowledge of the special conditions of aerial traffic.

Map reading, use of compass, location of position.

Remarks.

The practical tests shall be carried out within a maximum period of one month.

They may be carried out in any order, and each may be attempted twice. They shall be witnessed by at least two properly accredited examiners who will hand over the official reports to the proper authorities.

The official reports will give full details of the flights, especially of the landings. The candidates shall furnish, before each test, proof of identity, which the examiners have the right to demand.

A barograph shall be carried on all practical tests, and the graph signed by the two examiners shall be attached to their report.

11. Certificate for Navigators.—The candidate must pass a theoretical and practical examination in the following :—

(A) Practical Astronomy.

True and apparent movements of the celestial bodies.
Different aspects of the celestial sphere.
Hour angles, mean, true, and astronomical time.
Shape and dimensions of earth.
Star globes and maps.
Methods of determining latitude, longitude, time, and azimuth.

(B) Navigation.

Maps and charts—how to read them.
Compass—magnetic meridian—declination, deviation, variation.
Courses—bearings—and their corrections.
Compensation of compasses (technical and practical).
Calculations of azimuth.
Flight by dead reckoning—measure of the relative speed—drift, traverse table.
Chronometer—chronometer rate—comparisons.
Sextants—adjustments.
Nautical almanac.
Determination of positions by means of bearings and altitudes of stars.
Knowledge of great circle navigation.
Aeronautical navigational instruments.

(C) General Knowledge.

International rules for aerial and maritime navigation.
Practical knowledge of international aerial legislation.
Good knowledge of meteorology and of weather charts.

It seems probable that these Directions will cause more agitation than all of the rest of the Air Laws put together. To the free and independent pilot, used only to the slip-shod methods of the R.A.F., the Medical Requirements will doubtless seem purely tyrannous. Why should he not have more than two dioptres of latent hypermetropia if he pleases? Surely he can make a hobby of collecting these interesting pets if he likes.

Nevertheless, the pilot must remember that he is a public servant, and that he must be physically fit for his job just like a railway-engine driver, who is subjected by his employers to regular periodic medical examination. One is only surprised that the State has for so long permitted drivers of other public vehicles, such as omnibuses and taxi-cabs, to operate without proper medical inspection. The Nose and Throat requirements seem ambiguous. Does the sentence marked (*h*) mean that *both* nostrils must be clear, or that *either* (*id est*, one or other) must be clear? It would be foolish to turn down a really good pilot because, owing perhaps to a nose smitten in anger when he was a youth, one nostril was permanently bunged up.

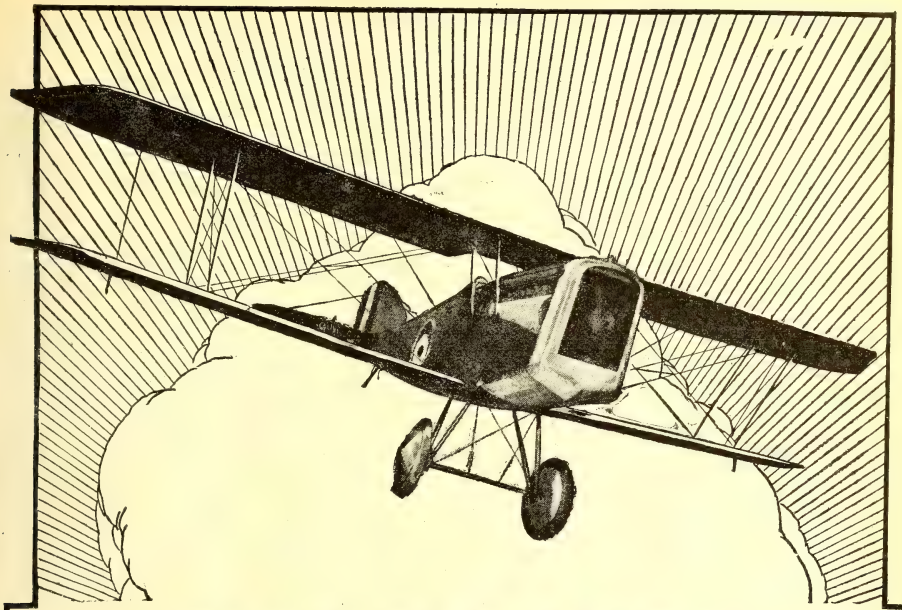
As a council of perfection the Medical Requirements are excellent, but in practice many first-class pilots who have never broken a wire suffer from ailments which would cause them to be rejected if the Directions were followed to the letter and not in the spirit. One only hopes that the official doctors will use intelligence as well as science, for if they do not they will force a great deal of unnecessary work on those Members of Parliament who are devoting themselves to helping the progress of British aeronautics.

The saving clause for existing pilots is that numbered 8, but even so the doctors seem to have been let loose to an undue extent in compiling the Directions.

Practical Tests.

The practical tests for both "A" and "B" Certificates are also likely to give rise to argument. The "A" test is certain to send up the fees of flying schools to a somewhat alarming extent, for the amount of tuition and practice necessary before a pilot can hit a 300-yard target from 4,500 feet is considerable, and a whole hour of flying, whether at 6,000 feet or 60, is going to add much to the cost of running the school.

The "B" test is even worse, for a firm will need a great deal of persuading before engaging a pilot, if it has to stand the cost of a 200-mile cross-country flight, and a night flight, before it can set him to work. Still, nobody is fit to pilot a public-service aeroplane unless



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he can pass such simple tests, so they seem to be inevitable. Presumably the war record of existing pilots will be accepted as proof that they have already passed such tests, and neither they nor their employers will have to go to the expense of doing it all over again.

The Technical Examinations may be either very easy or very sensible or very difficult or very idiotic according to the mental outfit of the Air Ministry examiners. If the examiners are chosen from among the sound practical men in France who won the war, all will be well. But if some of that wonderful combination of rogues and fools in the Technical Department—who very nearly succeeded in losing the war on various occasions—are allowed to intrigue themselves into good jobs as Technical Examiners then one can foresee a lot more work for those good Members of Parliament to whom one has already referred.

The proposed examination for Navigators' Certificates looks very terrible to an ignorant person like oneself, but here again, in all probability, the preceding remarks will apply.

THE NEXT INSTALMENT.

The next sections of the Regulations and Directions deal with the absorbing question of Certificates of Airworthiness, Periodical Overhaul and Examination. These subjects lend themselves to much discussion, so one proposes to leave them until next week.

(To be continued.)

GENERAL TRENCHARD'S RETURN.

Major-General Sir Hugh Trenchard, K.C.B., D.S.O., has now resumed his duties as Chief of the Air Staff, after having been absent for some months as the result of a serious illness.

This will be the best possible news to all who are concerned for the welfare of the Royal Air Force.

GENERAL SYKES' ACCIDENT.

All will learn with regret of the accident, involving the death of Capt. E. M. Knott, A.F.C., R.A.F., and the injury of Major-General Sir F. H. Sykes, Controller-General of Civil Aviation, which happened at Kenley Aerodrome on Saturday, May 3rd.

It appears that General Sykes was starting for Paris with Capt. Knott as pilot when the machine came down, whether owing to a side-slip or to engine failure is not known at the moment.

Kenley Aerodrome is one of the most dangerous in the country in the event of a forced descent while at an insufficient height in certain directions, as the only possible landing ground is on a steep hillside. One is told that this accident happened on that hill. Many pilots have alleged that this area should never have been taken over as a flying ground, and this accident seems to support their case.

It is generally rumoured that the accident was caused by the engine seizing-up because there was no water in the radiators. This absence of water has been commonly ascribed to *sabotage*, and it is said that the machine was prepared for General Seely, but that General Sykes took his place at the last moment. Personally one regards this talk of *sabotage* as mere idle gossip, but if it is proved that the engine was short of water one would not be at all surprised. Such carelessness would be quite in keeping with the lack of discipline and method in the R.A.F. of to-day.

All will be glad to learn that General Sykes is recovering quite satisfactorily from his injuries.

AN IMPORTANT APPOINTMENT.

The announcement has now been made publicly that Brig.-General Francis Festing, C.M.G., has been appointed Managing Director of Air Transport and Travel, Ltd., of which firm Mr. G. Holt Thomas is Chairman. It has been known for some time that General Festing was about to join Mr. Holt Thomas, but in what capacity was uncertain. Air Travel and Transport, Ltd., is to be congratulated on its new Director, and the R.A.F. will regret deeply his defection to civilian employment.

For the last three years or so of the war General Festing was chief personnel officer at R.F.C. H.Q. and R.A.F. G.H.Q. in France under General Trenchard and later under General Salmond. In the early days of the war, being an officer of the Northumberland Fusiliers, he served with the infantry and was badly damaged. Thereafter he was appointed to General Trenchard's Staff, where he won the highest opinions of all with whom he came in contact.

His charm of manner won the personal liking of his subordinates, and his sound judgment of men won the confidence of his seniors in rank. If one quotes correctly, it was said of Colonel Ward in South Africa that he was "the best Supply Officer since Moses." One may, perhaps, plagiarise that remark and say that General Festing is the best Personnel Officer since Aaron.

General Festing is essentially a soldier of the Old Army, and was naturally entirely out of sympathy with the Bolo House and all its works, therefore it is natural that he should leave it for a job where his unusual gift for handling men can be used to advantage. In his new capacity he will no doubt be able to do more to help the progress of aviation than he would in the Bolo House, but it is a thousand pities that the R.A.F. should lose him just when the very best men are needed to make it a force worthy of the King's Service.

However, he will, of course be available for the next war, and in the meantime tthe R.A.F.'s loss is a gain tto Civil Aviation.

INJUSTICES OF DEMOBILISATION.

It is quite time that a proper inquiry was made into the question of R.A.F. demobilisation. Those who want to get out find difficulty in doing so and those who want to stay in are being kicked out as discourteously as possible. The latest case concerns the officers of the Aircraft Acceptance Park at Hendon, which is being broken up so as to make room for Mr. Grahame-White and his aerial exhibitions.

A number of these officers signed on for the Army of Occupation some months ago, and were under the impression that they were definitely signing on for one, two, or three years as the case might be, and not that they were merely applying for temporary commissions. They have now received 28 days' notice to quit the R.A.F. They are not being given 28 days' leave on full pay in which to find a job, but they are to hang around for 28 days and then leave, without so much as a thank-you from the Bolo House.

They are all war pilots and most of them have been crashed or wounded. The only people, apparently, who are being kept on are the technical officers, most of whom, being technically trained men, could find jobs outside, whereas the pilots, being youngsters at the beginning of the war, have no means of earning a living.

If these officers are not wanted as pilots, surely it should be possible to make them technical officers on the strength of their experience as acceptance and test pilots, and to let the trained technical men go back to civil life, where most of them would prefer to be.

Another outrage on decency by the Bolo House is the case of disabled officers who have been doing Staff work at the Air Ministry. Many of these officers are quite capable of doing the brain-work of their offices and have been doing it thoroughly well. Now the war is over, one learns that able-bodied civilians who have never served in the field are being brought into the Bolo House to replace them. And, to add insult to injury, the maimed and disabled officers who cannot earn a living outside are being compelled to teach their jobs to the able-bodied civilians who are going to take the bread out of their mouths. Can Boloism go any further?—C. G. G.

ANOTHER INJUSTICE.

An R.A.F. officer raises a comparatively minor point which, although perhaps of little importance during the war, is likely to be very much more important in the future, especially if the Air Ministry carries out its intention of raising the standard of living in the R.A.F. and lowering the rate of pay.

It appears that when mechanics are sent out from a station to attend to a machine which has been crashed some miles away, they are theoretically entitled to put in a claim for any reasonable expenses which they may incur while doing so. That is to say, if the job takes longer than was expected and no rations have been served out to them, they are entitled to buy food on the spot and to be paid for what it costs.

In practice it appears that the mechanics and N.C.O.s in charge of them generally meet with an official refusal to repay them these out-of-pocket expenses, with the result tthat so far as one can gather they very seldom put them in. The result is that as a general rule the unfortunate officer who, probably through no fault of his own and generally through the fault of the Technical Department in supplying him with a defective engine, has had to make a forced landing and so has been the cause of bringing the mechanics away from their station has to pay the men out of his own pocket for whatever they have spent, or as an alternative, has to pay the local hotel-keeper for whatever they have been eating and drinking. Naturally he has no claim to get his money back or, at any rate, if he does claim for it he does not get it.

The whole system is obviously wrong and it would be well if the Air Ministry would inquire into the matter and issue proper instructions.


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THE DEATH OF PETER LEGH.

Aviation the world over has suffered a grievous loss through the death of Peter Legh, late Flight Commander, R.N.A.S., who was killed in an accident at Finchley on Saturday, May 3rd.

Peter Legh started at 10.10 a.m. from the London Aerodrome at Hendon, flying a Bat "Basilisk" biplane, with a 300 h.p. A.B.C. engine in an attempt to beat the World's Height Record. At 10.25 the machine fell in flames on a summer-house in or near the grounds of Holy Trinity Vicarage, East Finchley. His body was found some hundreds of yards away from the machine.

The Rev. W. J. Ferrar, Vicar of Holy Trinity, stated that the machine caught fire in the air, and that when near the ground the pilot jumped from the machine. It was found afterwards that one side of Mr. Legh's face and his hands were burned, so it seems evident that, seeing the impossibility of landing the machine before the flames caused him to become unconscious, he jumped out when fairly close to the ground as a last hope, but that the height was too great and he was killed by the fall. How or why the machine caught fire can never be discovered, unless by some good fortune a similar accident happens to another pilot with the same engine and carburetter while near enough to the ground for him to escape death.

Peter Legh's death is another terrible indictment of those incompetent technical people who throughout the war have made no serious attempt to make fire in the air impossible. If half the labour and material which has been expended in merely getting more and more power out of ordinary engines had been put into experiments to produce a satisfactory aero-engine more or less of the Diesel type, using heavy oil which could not catch fire as petrol does, we should have been safe against fire in the air a year or two ago. And until such an engine is built we shall never be free from that danger.

Parachutes are merely a means of escape, they do not prevent fire. Jacketed petrol-tanks may help a little, but they are no guarantee. The heavy oil engine is the only safeguard, and we shall go on losing our best and dearest in wholly avoidable accidents until it is produced. That is the most important task of all which lies before the new Department of Research.

In this case the pilot could have been saved by a parachute, but he was out after the Height Record, so he would not have carried the extra weight, even if a parachute had been available. But this accident is another proof of the fact, so often pressed forward in these pages, that parachutes must be made compulsory in all passenger-carrying machines, just as life-buoys are compulsory on board ship. In the "Basilisk" every possible precaution had been taken against fire, and yet she caught fire. So it is evident that a means of escape must be provided in every machine, no matter how well guarded it may be.



PETER LEGH.

A Personal Memoir.

Peter Legh was the only son of Major the Honourable Gilbert Legh, late Grenadier Guards, younger brother of the Lord Newton. Peter learned to fly at Hendon before the war, and at the outbreak of war joined the R.N.A.S. After qualifying he served at Isle of Grain and at Whitley Bay, near Newcastle, at which latter station he did much night-flying on the inadequate machines of the period in search of raiding Zeppelins. Later he went to Dunkirk, where he was promoted to Flight Commander R.N., and was in a great deal of air fighting.

While serving there he was wounded and badly crashed, so on recovering he was released for civilian occupation as test pilot for the Armstrong-Whitworth firm at Newcastle, where Frederick Koolhoven was works manager. When Mr. Koolhoven was appointed to create and manage the British Aerial Transport Company—more commonly known as the Bat Co.—Peter Legh went with him, and between them they produced in a very short time what was undoubtedly the finest single-seated fighting machine of its period, the Bat "Bantam" with the 180 h.p. A.B.C. "Wasp" engine.

This appeared late in 1917, but despite the enthusiasm of all the experienced active-service pilots who flew it, or even saw it, the Air Ministry refused to put it into production. The refusal was as great a blow to Peter Legh as to Frederick Koolhoven, for he knew its capabilities—which those who refused it, being ignorant of war flying, did not—and he did some of the finest flying ever seen in his efforts to convince these officials of its excellence, and of their own foolishness.

In 1918 the Bat "Basilisk" was produced to meet Air Ministry specifications. It was not a commercial machine, as stated in the "Times" and "Telegraph." It proved to be the fastest machine in the world, its speed being over 160 miles an hour. Its climb was equally astonishing, and Peter Legh saw at last the prospects of proving to the world the errors of the Air Ministry. A series of test flights showed that he had any records he liked at his mercy. He started for the first of them, and we know the lamentable result.

One of the most experienced of R.N.A.S officers set down some three years ago a list of the half-dozen best pilots in the world, including such people as Roland Garros, Hucks, and Hawker, and he put Peter Legh among them (though he was then a very young pilot) because of his perfect judgment in handling an aeroplane. Thereafter Peter Legh became not only a much better pilot, but a splendid judge of aeroplane performance, design, and construction. When he took the Bat "Bantam" to Paris last summer the leading French authorities were astonished at his flying, and the late Roland Garros himself expressed his unqualified admiration of his skill.

Peter Legh and Frederick Koolhoven made a wonderful combination, for the pilot's absolute reliability and high judgment as a tester were a perfect guide for the designing and constructing genius of the engineer. So perfect was the understanding between them that the result was as if one man had been doing both the testing and designing. They were, as it seemed, critic and author in one.

If the pilot found that a machine had any peculiarity or trick in the air, the engineer at once spotted the cause and cured it. If the engineer wanted a test of any particular point of performance or handling, the pilot at once tested that point with as much intelligent comprehension as if it had been one of his own devising. In their work the two were as one mind, and their personal relations during the years in which they lived and worked together were of the kind from which the legends of great friendships have sprung.

The way in which those who know Peter Legh regarded him was quite unusual. Among the R.N.A.S. people with whom he served in his early days, among the people in the works at Newcastle and at Willesden, and among the R.F.C and R.A.F. people at Hendon with whom he spent much of his time latterly, he was not popular in the ordinary sense. It would be more correct to say that they all loved him. His quiet gentle manner won everybody's affection, but it concealed a firmness of will and intensity of purpose which won everybody's respect.

To those who knew him he was always "Peter." None ever thought of calling him by his surname. More often he was called "Little Peter," as a mark of affection. Yet the most experienced war pilots stood and looked on in respectful admiration when Peter was getting ready to fly and when he was in the air. He was essentially what the French describe by the untranslatable word *sympathique*.

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Our Organisation which has in the past been responsible for our success in design and production of NAVAL and MILITARY aircraft is now concentrating its energies on the development of Commercial Aircraft. Enquiries are therefore solicited from Governments, Companies, or individuals interested.

In his ways Peter was very young, and he had a childlike simplicity which made the contrast all the more astonishing when one found that he was extremely well read and held very pronounced views on all the subjects of the day. Which deceptive simplicity was perhaps the mark of his caste, for Peter was typical of those clean-bred, clean-living young aristocrats who made the British Army what it was before the war, who led it to victory in the war, and who, in their younger generations, may yet by that same simplicity and ability of mind make this nation again what it used to be before the stress of war and the machinations of politicians set almost everybody in their wrong place. After all these years of war one would expect to find our fighting men fairly hardened to the loss of their dearest friends, but never even before the war has one seen such genuine sorrow shown over the death of a man as was clearly to be seen at Hendon on the day Peter died. One hopes that it may be some small consolation to his father and mother, and to Peter's dearest friends, Frederick Koolhoven and his wife—his devoted companions in many strenuous years of motor-racing and flying—to know that so many of us grieve with them in the loss of Peter Legh, whom we knew and loved so well.—C. G. G.

THE ROYAL AERO CLUB.

THE ENTRANCE FEE AND SUBSCRIPTION FOR NEW MEMBERS.

In accordance with the Resolution passed unanimously at the Annual General Meeting of the Royal Aero Club on March 31st, 1919, the Subscription for Members elected on or after May 31st, 1919, will be £7 7s. per annum and the Entrance Fee £5 5s.

Committee Meeting.

A Meeting of the Committee was held on Tuesday, April 29th, 1919, when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.; in the Chair, Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F., Lieut.-Col. F. K. McClean, Brig.-Gen. E. M. Maitland, D.S.O., Lieut.-Col. J T. C. Moore-Brabazon, M.P., Lieut.-Col. Alec Ogilvie, and Mr. H. E. Perrin, Secretary.

Election of Members.

The following New Members were elected:—

Sec. Lieut. Archibald Henry Allardyce, R.A.F., Lieut. John Maxwell Poole Baird, R.A.F., Major Vernon Sydney Brown, R.A.F., Major Reginald Hugh Carr, R.A.F., Capt. Geoffrey Ernest Clinton, R.A.F., Harry Ernest Dale, Capt. William Forster Dickson, D.S.O., R.A.F., Paymaster-Lieut. Norman Stanley Douglass, R.N.R., Major Roger Martin Field, R.A.F., Lieut. Harold Fraser Game, R.A.F., John Granville Grenfell, Capt. Adolph Herbert Handman, R.A.F., Major Duncan Clive Mackenzie Hume, R.A.F., William Oscar Kennington, Johan Frederik Lebret, Capt. John Charles Liddle, R.A.F., Horace Gordon Lowe, Lieut. Francis Peabody Magoun, R.A.F., Capt. Thomas John Clement Martyn, R.A.F., Lieut.-Col. Derick Merens (Dutch Army), Major Thomas Baxter Milne, R.F.A., Capt. Samuel Eric Neal, R.A.F., Major Henry Andrew Robert Norton, R.A.F., Lieut. Cyril Eustace Prescott, R.A.F., John Herbert Redpath, Henry Herbert Reynolds, Major John Hunter Rutherford, R.A.F., Lieut. William George Sitwell, R.N., Capt. Reginald Noël Swann, R.A.F., Cyril Charles Teesdale Turner, Frank Ford Peregrine Walsh, Capt. Frederick James Watts, R.A.F., Lawrence Arthur Wingfield.

Election of Stewards.

The Stewards of the Club were re-elected as follows for the current year:—

The Earl of Lonsdale, Admiral The Hon. Sir Edward H. Seymour, P.C., G.C.B., O.M., G.C.V.O., Hon. Arthur Stanley, M.V.O., M.P., Sir Charles S. Henry, Bart., M.P., Lieut.-Gen. Sir David Henderson, K.C.B., D.S.O., Professor Sir John H. Biles, LL.D., D.Sc.

Technical Committee.

The following Technical Committee was appointed:—

Mr. Griffith Brewer, Lieut.-Col. D. Harries, R.A.F., Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F., Lieut.-Col. F. K. McClean, Brig.-Gen. E. M. Maitland, D.S.O., R.A.F., Major R. H. Mayo, Lieut.-Col. Alec Ogilvie, R.A.F., Lieut.-Col. Mervyn O'Gorman, C.B., Lieut.-Col. T. H. Tizard, R.A.F., Mr. Howard Wright.

Federation Aeronautique Internationale.

The report of the delegates (Lieut.-Col. Mervyn O'Gorman, C.B., Lieut.-Col. Alec Ogilvie, and Mr. H. E. Perrin) who attended the Conference of the Fédération Aéronautique Internationale in Paris on April 11th and 12th, 1919, was received.

A letter from the Fédération Aéronautique Internationale was read convening a further Conference of the Fédération to be held in Paris on May 19th, 1919, and the following delegates were appointed to represent the Club:—

Lieut.-Col. Mervyn O'Gorman, C.B., Lieut.-Col. J. T. C. Moore-Brabazon, M.P., Lieut.-Col. Alec Ogilvie, Mr. H. E. Perrin (Secretary).

The Secretary was instructed to forward several items for the Agenda, including the passing of World's Records for Aeronautical performances put up during the War.

"Daily Mail" £10,000 Trans-Atlantic Flight.

It was reported that the proprietors of the State Express cigarettes had offered an additional prize of 2,000 guineas to the winner of this competition.

The following additional entry was reported:—

The Alliance Aeroplane Co., Ltd.: 450-h.p. Napier "Lion" Engine. Pilot: Capt. W. R. Curtis, R.A.F.

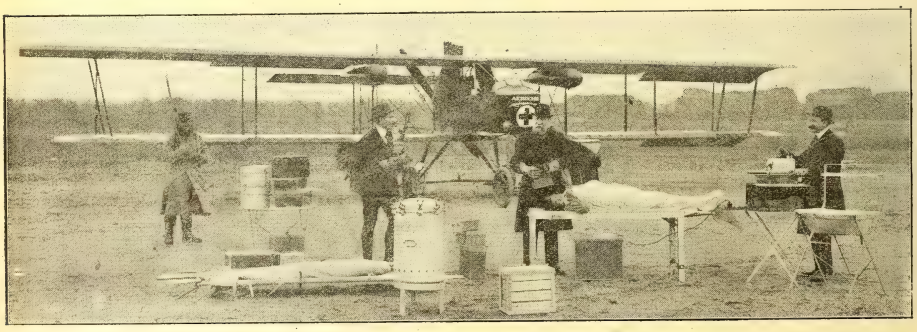
WORLD'S AERONAUTICAL RECORDS.

The Fédération Aéronautique Internationale is the sole authority for granting World's Records for flying performances, and the Royal Aero Club is the Official representative of the Fédération for the British Empire.

The Fédération, being international, it has not been possible for any world's records to be ratified during the War, and consequently any statements which have been published as to world's records having been made during the War are not official and are likely to mislead the public.

With the resumption of civilian flying, the Royal Aero Club will be in a position to supervise attempts on records under the Fédération Aéronautique Internationale and the Competition Rules of the Royal Aero Club.

Any person wishing to claim a World's Record for a flying performance carried out since 1914 is particularly urged to forward particulars to the Royal Aero Club for verification and subsequent ratification by the Fédération Aéronautique Internationale.



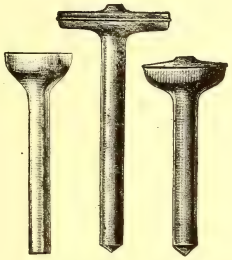
THE "AERO-CHIR."—The Voisin Aeroplane Ambulance in operation. All the paraphernalia shown are carried on the Machine.

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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

Some Questions for the Bolo House.

It has been interesting to read the evasive answers given in Parliament to well-meaning inquirers who are anxious to know the truth about the deliberate destruction of serviceable machines.

Can a really sound reason be given as to why brand new D.H.9s should be taken out of packing cases, the engines hacked out of them and the machines destroyed?

Can a really sound reason be given as to why brand new "Camels" should be sent to Acceptance Parks, there to be burnt?

Is this waste being done to avoid future waste, or is someone gaining by the carrying out of contracts leading to the destruction of those contracts?

It makes one a little inclined to become frothy at the mouth when one knows that aviation is in its infancy still in Japan, South America, Spain, and the countries which have not advanced as we have in flying. It seems feasible to pass these machines on to those who require them for what they will fetch. But as long as our M.P.s are content to accept indirect answers the glorious orgy of expenditure will go on.

Congratulations.

Recently "The Snipe" pointed out in these pages that evening newspapers could be more advantageously distributed by means of aeroplanes than could morning papers. One is pleased to note that the London "Evening News" has been the first to adopt the suggestion. Mr. Sidney Pickles is the pilot of the Fairey (Rolls-Royce) seaplane which carries the papers from the Thames between Lambeth and Westminster bridges to the east coast.

A Great Discovery

A writer in the "Daily News" reveals the following discovery to the world:—

"If you go downstairs and grab the first man or woman of an average age whom you meet, the chances are that you can train him or her to fly.

"Flying requires the same curious kind of knack which riding a bicycle requires. It is a question of acquiring a particular sense of equilibrium."

Since the publication of the results of the author's researches it is understood that in future pupils at schools of aviation will undergo a preliminary test, in which they must show their ability to ride a bicycle without stalling or allowing it to nose-dive.

The Camera Cannot Lie, but——

The "Daily Sketch" recently reproduced a photograph entitled "Hawker's Trial Flight." Careful scrutiny reveals some interesting information. One had heard rumours to the effect that after leaving the ground Mr. Hawker intends to drop his undercarriage, but his method of attaching floats in mid-air has not yet been described. Clearly he must have discovered a means of accomplishing this because the photograph plainly shows the floats, and the journal describes the machine as a Sopwith seaplane.

One presumes, therefore, that Mr. Hawker has been practising the difficult task of leaving his aerodrome in Newfoundland on his land machine, substituting floats for the wheels during flight and alighting on the sea as a perfectly equipped seaplane.

Or is it possible that the "Daily Sketch" has found an old photograph of the Sopwith seaplane on which Mr. Hawker made his flight round Britain in 1913, and has brought it up to date by the simple process of calling it the trans-Atlantic machine?

Assurance!

The following story illustrates the abysmal ignorance of insurance companies regarding aircraft risks.

A certain aeroplane manufacturer telephoned to a company to ask what premium would be quoted to cover risks to an aeroplane during a one-day flight from London to certain Midland cities. The value of the machine was considered to be £2,000.

The assurance company promptly quoted £45 as the premium for one day. This so amazed the manufacturer that he thought it advisable to replace the receiver before he expressed his views.

On the following day the Company's representative rang up to say that the proposal had been reconsidered and that the premium would be not £45 but £15!

The manufacturer is now wondering what sum will be asked if he waits for a week.

What is a Pieutenant?

The following appeared in the "Times" on May 1st:—

"Starting next Saturday and continuing throughout the whole of next week daily, flights will be made from Messrs. A. V. Roe and Co.'s aerodrome at Hounslow. The public will be able to participate in the flights, a charge of 20s. per head being made. Avro five-seater machines, fitted with Le Rhône engines, will be employed. The pilots will be Captain Fagan, Lieutenant Park, Pieutenant Hastings, and Colonel Henderson."

It is understood that no additional fee will be charged for flying with the Pieutenant. One wonders, however, what this worshipful journal means by: "Starting next Saturday and continuing throughout the whole of next week daily." It causes one to ponder upon the fares that would be charged for flights continuing through the whole of next month weekly.

Aircraft at the Academy.

Evidently aircraft are forging ahead in the social world. At Burlington House there are several paintings devoted entirely to aerial subjects. And it seems to be quite the thing to dot an odd aeroplane or so in the background, just to let one know that the artist is up to date.

I saw a miniature even, a child's head, with a cloudscape background and an aeroplane over the right ear, and I am not sure it would not have been the best effort of the lot if the artist had left cut the portrait part, as the clouds and sky are just as one sees them on a breezy day at 6,000 feet or so.

The picture which evidently impressed the artistic mind most, to judge from its prominent position, depicts a British photographic machine being chased back over the lines by a mass of, presumably, infuriated Huns. After much thought, I came to the conclusion that the said 'bus was a R.E.8, as the artist had got the exhaust pipes in the right place, but I will not back my opinion. Anyway, the pilot is having a lively time, surrounded by clouds, Archie bursts, and Huns, and apparently his fuselage has telescoped. I suppose it is an impression of the pilot's state of mind commonly known as "wind up." I give up trying to guess the species of Hun the artist had in mind; *he* wins that trick.

There is a good picture of ground strafing, but the machines are only a background for a German transport column thrown into confusion by bombs. It would have been a far more powerful scene if the aggressor had been a "Camel" using its machine-guns instead of these aeroplanes of uncertain type, which appear quite detached from the scene of action.

The finest study of aircraft to my mind is "The Channel Patrol," by Capt. C. E. Turner. One can hear the roar of the engines and feel the lash of the spray as one looks at the F.2a flying boat taking off. A picture of a U.S. destroyer picking up the crew of a sinking seaplane will recall pleasant memories to those who had the privilege of doing patrols on certain seaplanes with certain engines, neither of which I shall specify. The artist is equally discreet.

Other pictures of sea aircraft there are in plenty, but only one to which it is worth while to draw attention, namely, "The Avengers," a fine panorama of ships doing a sweep for a submarine, assisted by aeroplanes and seaplanes. The only quarrel I have with this artist is that he has got a battle-cruiser on the job. The "big ships" are not usually to the fore in an operation like this; they leave such unpleasant work to the R.N.R. However, he means well, and perhaps the battle-cruiser was the object of the submarine's attack.

There are several pictures of the surrender of the German Fleet, but unfortunately that event occurred in thick weather, and all the artists have forgotten that point. It is a pity, especially in the case of the gentleman who has inserted a Handley Page, and an airship like an N.S., but with the envelope of a Zero. The fog would have saved him a lot of mistakes.

One of the most striking portraits is that of the late Sec. Lieut. R. Morgan, of 55 Squadron, R.F.C., by Solomon J. Solomon, R.A., which will be of great interest to those who knew this officer. One picture I must mention, although it is not concerned with aircraft, is Lieut.-Commander Norman Wilkinson's "The Merchant Service." The artist was one of the prime movers in the development of dazzle painting, and this seascape with the solitary ship's lifeboat being shelled by a submarine is a splendid tribute to the men whom he helped with his art.—Ex-Pilot.


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The WORLD of AERONAUTICS (continued)

An Aeroplane for Sale by Auction.

An aeroplane was offered for sale by auction on April 29th at the Grahame-White Auction Rooms, Hendon. The machine was described as a Grahame-White Bantam (1919), a sporting single-seater aeroplane, fitted with 80-horse-power Le Rhône engine, speed over 100 miles an hour, landing speed 40 miles an hour, weight, empty, 640 lbs., and in splendid flying condition.

A bid of £100 was quickly followed by another of £200. After a pause the bidding went to £250, £300, and £350, and then, after a longer pause, £375 was bid. By bids of £25 the price rose to £450, but as there was a reserve on the machine of £500 it was then withdrawn.

It has been stated in the Press that this is the first time an aeroplane has been offered for sale by auction in England, which is pure rubbish, because many aeroplanes were sold by auction before the war.

200 Miles per Hour.

Major-General Seely, Vice-President of the Air Council, said recently to a representative of the "Daily Mail," that the Government experts can see their way to 200 miles per hour with the present type of aeroplane, but for greater air speeds some type altogether different is needed with super-engines and new materials to withstand the strain.

"It is possible (he said) that the most extreme speeds, after all, will be found on land and not in the air. We have attained certain speeds and climbing ability—now we want flying to be made safe, certain, and convenient. A large sum will be spent by the Air Ministry in experiment and research along the lines indicated."

Apparently the lines indicated are not railway lines as the reference to "the most extreme speed" on land might lead some people to think.

To Canadian Aviators.

Canadians of all ranks in the R.A.F. who are interested in co-operation for military, commercial, and social purposes on their return to Canada are invited to write to "Canfly," c.o. THE AEROPLANE, 166, Piccadilly, W.1, giving their names and addresses.

As stated last week, this has nothing to do with an employment agency, nor is it concerned with a register of pilots. It is merely an effort on the part of a Canadian officer, who is returning to Canada, to keep Canadian aviators in touch with developments and with one another.

A Fatal Accident.

A fatal flying accident occurred on May 1st, at Stebbing, near Dunmow, Essex. The machine, a two-engined Vimy bombing aeroplane, was travelling from an aerodrome near Crayford, Kent, to Norwich. All the occupants were civilians, the pilot being Mr. James Dennis Chattaway, employed at Vickers' works at Crayford. He was accompanied by Mr. Walter H. Jones, foreman of the Vickers works at Crayford, Kent, and Mr. Harold James Geddes, also connected with the works.

Mr. Jones sat beside the pilot and Mr. Geddes occupied the cockpit behind. The starboard engine failed over Dunmow, and the pilot came down in a wheat field at Stebbing.

The aeroplane ran along the ground, crashed into a ditch, and was smashed. Mr. Geddes was thrown out on the wings, and escaped. The engine took fire, and the pilot and Mr. Jones were imprisoned in the wreckage. Mr. Chattaway was taken out injured, but alive. Mr. Jones was suffocated. He was a married man living at Dartford.

At the inquest on May 1st, at Stebbing, near Dunmow, on Mr. Walter Jones, Captain O. H. D. Vickers, for Vickers, Ltd., said the machine was being delivered to the Government at Norwich. The engines were of foreign make, and the larding skids had been removed to fit the aeroplane for landing on water. This was why the aeroplane went over on its nose.

All-Metal Aeroplanes.

Readers are reminded that on Wednesday next, May 14th, Capt. A. P. Thurston, D.Sc., R.A.F., will deliver a lecture to the Royal Aeronautical Society on the use of metal in place of wood in aeroplane construction.

The lecture will begin at 8 p.m., and will be given at the Royal Society of Arts, John Street, Adelphi—close to Charing Cross Station. As metal construction has now advanced to the stage of equalling wood in weight and local strength, and surpassing it in constructional strength, all who are concerned with the use or construction of aircraft should make a point of attending the lecture.

In this connection readers are referred to the remarks of Lieut.-Col. Ogilvie and of Mr. J. D. North, which appear in the *resumé* of the latter's lecture on page 1836 of this issue.

Tickets for Capt. Thurston's lecture may be had gratis from Mr. W. Barnard Faraday, the Royal Aeronautical Society, 7, Albemarle Street, W.1.

Demobilised.

Dr. Yorke Davies, having been demobilised from the Royal Air Force Medical Service, has returned to 44, Harley Street, S.W.1.

A Criticism of Swedish Machines.

The Secretary of the Swedish Aeronautic Society, M. Tersten Gullberg, who was one of the Swedish judges at the flying competition at Copenhagen, has returned to Stockholm. In an interview he said he had met several British, French, and German aviators in Copenhagen who praised the Swedish machines, especially as regards their strength and finish. With regard to variety of types, however, the Swedish machines were considered to be not sufficiently up-to-date.

Brains v. Superficial Smartness.

The following letter has been received :—

Sir,—I have just been reading the article by "The Snipe." It seems to me that his are rather biased views of the other extreme.

Of course, as you know, my views on discipline are rather on the principle that it is a damned good thing and it should be instilled into everyone—except myself. However, I make the proposition to "The Snipe" for the ten thousand and first time that in ninety cases out of a hundred the efficiency of a station does still, and always will, depend on its smartness on parade.

Take a station, for instance, run by ——, late of one of the big flying schools, who is probably one of the greatest exponents of the "Boom" traditions.

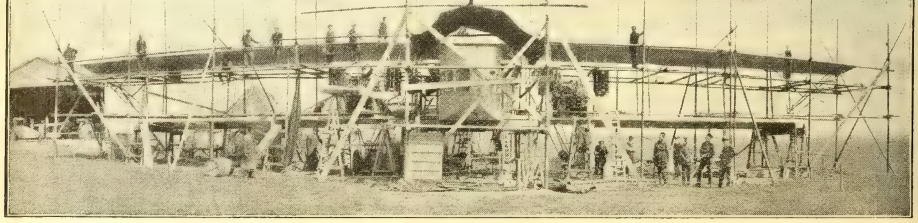
If you dared to walk up to him instead of doubling when he sent for you your life wouldn't be worth a 2 c. Yet I remember him saying once at Shoreham that he hated to see an officer in the sheds with a spotlessly clean tunic nearly as much as seeing one in Brighton with a dirty tunic.

Personally I loathe him, because I, as usual, got up against him, but I would set him up as my model of efficiency and discipline if ever I proposed to be a R.A.F. general.

Of course, you do get some C.O.'s, adjutants, and serjeant-majors who have got no idea of the proportion in which military discipline and technical efficiency should be doled out.

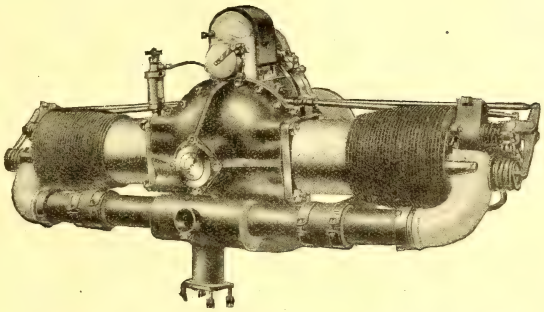
Look at the name the R.F.C. had before the war and look at the R.A.F. now. It has tons of technical efficiency and merely ounces of military discipline, and it is that lack of saluting which gives to the R.A.F. its present contemptuous name and enables George Robey to get his best laugh of the evening by remarking that he has no vices, doesn't smoke or drink, and hasn't a friend in the Air Force.

Supposing you flew over to another aerodrome for lunch and told a mechanic to have your machine filled up. If that mechanic gave you a hell of a good salute you could bet your life the machine would be ready when you got back. If he merely looked at you and perhaps touched his cap and mumbled to himself nine cases out of ten when you came back nothing would have been done. (Signed) DEMOBBED.



THE KENNEDY GIANT BIPLANE (Two 200 h.p. Salmson Engines), being erected at Northolt Aerodrome in 1917. It is described fully on page 1840 of this issue.

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The WORLD of AERONAUTICS (continued)

The Eastbourne R.N. Air Station's Dinner.

It is proposed to hold a Reunion Dinner for Officers of the R.N. Air Station, Eastbourne, 1915-16. Those willing to help in arranging it are requested to meet at the Royal Aero Club, 3, Clifford Street, on Thursday, May 8th, at 5.30 p.m.—Sandy and "Doc" Anderson.

An Independent Air Force Dinner.

A Dinner will be held on June 14th, at the Savoy Hotel, at 7.30 p.m. for 8 p.m., for all Officers who served at any time with the Independent Air Force. All those wishing to attend should communicate with Major W. G. P. Young, Room No. 668, Air Ministry, London, W.C.2, on or before June 1st, enclosing cheque for two guineas. Evening dress or uniform.

United by Air.

Mr. Winston Churchill has sent a telegram to the Pan-American Aeronautical Congress, which was opened at Atlantic City on Thursday, saying: "Ocean divided us, may Air unite us."

So now it is up to America to say that the little fuss about the tea-chests in Boston Harbour has been forgotten.

No Limit to Luggage.

A Handley Page twin-engine machine flew on May 3rd from London to Brighton, thence to Eastbourne and Hastings, with seven passengers and 9 cwt. of luggage. Major E. L. Foot, M.C., was the pilot.

The 9 cwt. of luggage leads one to believe that some of the passengers were ladies.

An Aviators' Club in Vancouver.

The returned aviators now in Vancouver and adjacent cities have formed an Association known as the "Air Service Association of British Columbia," with temporary headquarters and club rooms at 821, Pender Street West, Vancouver City.

Lieut.-Col. Collishaw is the Hon. President, and among the list of members are officers and men who served in the R.N.A.S., R.F.C., and R.A.F. Applicants for membership must have served (or be serving) in one of the Flying Services of the British Empire.

The objects of the Association are (1) to continue the friendships amongst the members which have been formed while serving the Flag; (2) to look into and try to have adjusted all matters pertaining to discharges, gratuities, pensions, etc.; and (3) to do everything possible to encourage flying in Western Canada.

Australian and New Zealand aviators on their way home *via* Vancouver will be welcomed at the Club.

General Stefanik Killed.

It was reported on May 5th that General Stefanik, the famous Czecho-Slovak aviator and commander, had been killed in an aeroplane accident near Pressburg. He was flying from Italy to Prague with several Italian officers. For some unknown reason the machine fell from a height of 1,300 ft., and all the occupants were killed.

General Stefanik, who was a Slovak by birth served in the French Air Service during the war.

Trial by Court Martial.

At a District Court Martial held at the Royal Air Force Headquarters, Upton, Chester, on April 29th, Flight-Cadet Harry Willoughby Ray, of Shotwick, Chester, was charged on two counts (1) that on April 21st he flew an aeroplane at Chester at a low altitude contrary to standing orders, thereby causing damage to 14 telegraph wires, and (2) with flying an aeroplane at Chester at a low altitude to the danger of the public. The accused pleaded "Not guilty."

Evidence in support of the charge was given, Cadet Ray giving evidence on his own behalf.

The prosecutor pointed out the danger of low flying near towns, and pressed for a sentence deterring aviators from committing this offence with impunity.

Sentence will be promulgated in due course.

A Flight Over the Andes.

For many years the Chileans have delighted to call themselves the "Britishers of South America," and in the air they are certainly proving themselves pilots worthy of the name. A telegram from Santiago de Chile of April 5th announces the fact that Lieut. Cortinez made a successful flight over the Andes, attaining an altitude of 6,000 metres (19,600 feet). The feat was accomplished on one of the "Bristol" aeroplanes recently presented to the Chilean Government by the British Government.

This is not the first occasion on which the Andes have been crossed on a "Bristol" machine, for it may be remembered that last December Lieut. Godoy, another Chilian aviator, accomplished the feat on an aeroplane of similar manufacture, crossing from the Chilean capital to Mendoza, in Argentina, in 1½ hours.

The crossing of the Andes by aeroplane has more than a passing or theoretical importance. The Transandine Tunnel, which affords the only means of comparatively rapid communication between Argentina and Chile, and, therefore, between Chile and Europe, is unfortunately impassable for days at a time owing to snow-drifts. The only present alternative is the tedious passage by sea through the Straits of Magellan. For the carriage of mails and for the more speedy requirements of passenger traffic it appears likely, therefore, that the crossing from Chile to Argentina may shortly develop into a regular service.

Fashions for Elopements.

There is one section of the "Evening Standard" that I never read, but a musical cooing from the other side of the table made me wonder what there could be so attractive on the Fashion Page. Afterwards I looked—and saw! "Becoming Fashions for Flying Women," was the caption, and beneath it stood a maiden reminiscent of Ingoldsby's "subaqueous Lurline," whose "one garment was looped up with bunches of coral." This *degagée* wench was labelled, "None but the Smart deserve to Fly," which seems to have "per ardua ad astra" beaten any way you look at it. This intrigued me so that I removed the paper gently, but firmly from its erstwhile reader, considerately substituting "Bradshaw's Railway Guide."

"When Flying Flossie decides to elope with Airy Arthur," I read with delight, "in a dinky two-seater built specially for the purpose. . . . (Mmm, *what* purpose?) she does not mean to seek her happiness in the skies in anything except the most becoming costume the genius of her dressmaker can devise. . . Now, it has been proved that a woman can wear breeches and still retain the sweetness and grace and modesty and all the other virtues necessary in the make-up of the really 'nice' woman . . . the 'flighty' woman will be a model instead of a terrible example."

A pity we cannot reproduce her, though. You ought to see her. And you ought to see her biplane in the middle distance, with four struts for one wing section, and one for the other, and a tail which resembles one of Messrs. Beeves paint brushes, beginner's size. "Bedford cord upholstery to match your flying suit," "soft leather, of saxe blue"; to this favour *Shall* we come at last?"—R. H. B.

The Bolo House as seen from the Front.

The following letter has been received:—

Sir,—In the good old days—we always speak of good old days—when the Royal Flying Corps consisted of a small number of suicidal enthusiasts, De Keyser's Hotel was taken over by the Government to be the headquarters of the R.F.C., and it was re-christened with the romantic name of Adastral House.

To its portals came all those in need of advice or advance pay—until a visit to town could not be considered complete without a visit to "Hot-air" House.

And then, when the Corps grew until its dimensions necessitated the formation of the Royal Air Force, the scene of its Headquarter activity had shifted to the Hotel Cecil, and in Adastral House the dust accumulated, to be occasionally disturbed by a gust of feminine laughter and the revelry of a dance (*vide* the Carmelite Press).

The high-sounding title of "Air Ministry" degenerated into the impertinent epithet, "The Bolo House," which was so named because of its amazing ingenuity in attempting to lose the war.

Or so it seemed to us at the Front.

When I came home on leave, I was taken by anxious friends and relatives to funny plays in London, in order to obliterate from my mind the grim horrors of war. But for sheer amusement, combined with the horrors of war, I preferred a visit to Bolo. For there, from the moment of jaunty entrance to the moment of weak-kneed exit, the experience was one to remember and relish.

But the authorities must have grown wary, for on a later visit I found that without the permission of my commanding officer access was denied to me, and the motto of our Corps had changed to "Per ardua ad Bolo."

So I could only stand at the door and watch the kaleidoscopic procession of red tabs and gold-leafed majors within, until the thought was forced upon me that in order to gain promotion it was necessary never to fly.

And I returned to my job of flying, dispirited and dejected. For once, I had failed to see the humour of Bolo. Yet, somehow, I preferred the cramped seat of my cockpit and the gouts of oil blown back onto my face, to the ease of a swivel-chair and the insipid taste of tea and ink.

To us in France the typical Boloite was either an old old gentleman with no wings but with the Crimean medal, or a very young gentleman with no wings but with the O.B.E.. They all seemed to be majors, they all seemed to have cars, and they all seemed to be truly terrified at the thought of themselves aviating.

In France, in Belgium, in Mespot, in Palestine, in East Africa, and in the other unhealthy spots where war was waged, we trusted our wing headquarters, we trusted our brigade headquarters, and we trusted our General Headquarters, but we never trusted the Bolo.

For the Bolo was not alive to the war, its inmates shuddered at the thought of war, and those who had caught a glimpse of the war were in no hurry to renew their acquaintance.

So it came about that when the war-weary pilot returned to England the thought of temporary peace and enjoyment soothed his nerves and made him glad to be home again. But the worst possible insult to offer him was a job at the Bolo.

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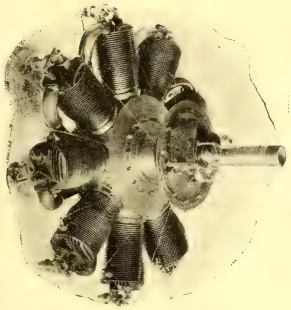
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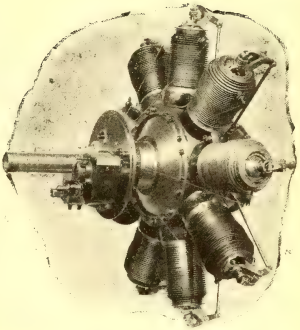
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NOTES BY THE PUBLISHER.

What are the revelations of Roy? They are the satiric stunts of one who during the war was just an air mechanic. Who he is there are no means of knowing. The Air Force will ask in vain. If the Air Force knows him not, he knows the Air Force, and he indulges in much wit and wisdom at the expense of its past and present chiefs and of those good fellows who, with all their foibles, made it what it is. "The Revelations of Roy," small book though it be, fires a whole drum with a merciless disregard of personality, high or low, and the only person to whom Roy apologises is that great scribe Artemas, whose style he adopts with immense success. Everyone who likes a good laugh at other people's peculiarities and weaknesses will read "The Revelations of Roy," which can be bought for 1s. net.

To pass from "The Revelations of Roy" to "Flying Colours" is very like stepping from the ridiculous to the sublime, from impudence to dignity. "Flying Colours" is by Captain H. M. S. Saundby, M.C., Zepp-strafer and among the most enterprising of the pilots who won for Great Britain the mastery of the air on the Western front. Captain Saundby paints as well as he flies—and, we believe, is by profession an engineer. Anyway, twenty more delightful and realistic pictures in colour we have never seen. They are unique. Major-General Ashmore in an introduction says they give "a true and vivid idea of things as seen by a pilot in action." The book makes the most charming of presents. Every flying boy's mother should possess a copy, as it affords an idea of his work which neither pen nor camera can hope to rival. Everyone interested in the doings of the Royal Air Force in war-time should seize this opportunity for securing a souvenir. An *Edition de luxe*, numbered and limited to 250 copies, is published at £2 2s. net; a Popular Edition at 15s. net.

Aces win battles in the air as well as tricks at the card-table. McCudden was the British ace of trumps, Richthofen the German. The two were examples of nationals at their best. Both wrote their reminiscences and described their methods and their triumphs. Both were sportsmen, and how far ahead British is of German sport will be fully realised by the simple, modest narrative of the one and the thinly veiled sense of superiority of the other. Read both books and you have the heroes of two Empires self-revealed. McCudden's "Five Years in the R.F.C." (7s. 6d. net) and Richthofen's "The Red Air Fighter" (Second Edition, 3s. 6d. net) must have a corner in every properly equipped aeronautical library. No pilot's education is complete unless he has studied both.

Civil and commercial aviation began officially as from May 1st. The problems opened up of costs, of routes, of possibilities of making it profitable are the subject of wide and varied speculation. Captain Arthur Swinton, with a lively sense of the need for careful and authoritative estimates, worked at the subject well in advance, and that his "£ s. d. of Flying" (6s. net) is of considerable practical value is proved by the fact that it commands the interest not only of the aircraft industry and the trader at home, but is in request from the West Indies, Africa, and Australia. It is the book of the moment, though a few years hence it may be looked upon as a prophetic curiosity.

Aeroplane building during the war was a business that had to be learned in a hurry; in peace-time it can be learned as any other business is learned—methodically and deliberately. But nothing can deprive the proved text-book of its usefulness, and Mr. Stepney Blakeney's "How an Aeroplane Is Built" (2nd Edition, 5s. net) may claim to be such a text-book. The secret of its success is easy to explain. Mr. Blakeney is a practical worker himself. He knows what others want to know, and he is able to impart his knowledge simply and effectively. The good mechanic becomes a better by taking a leaf out of Mr. Blakeney's book.

A simple yet expert guide to the aero-engine is badly wanted. Mr. C. Sylvester, A.M.I.E.E., has undertaken to supply the want. The quality of his work on "The Design and Construction of Aero Engines" (6s. net) is proved by the fact that much of it has appeared in THE AEROPLANE. New chapters and new diagrams make it complete. It will be ready in a day or two, and the engine designer and constructor, as well as the flying man who would understand the essentials of an engine, will turn to Mr. Sylvester for guidance.

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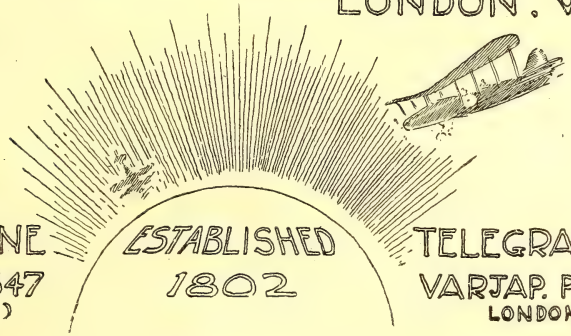
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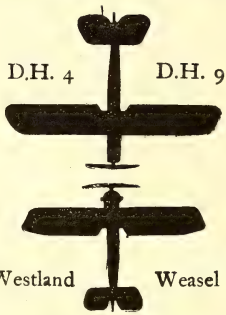
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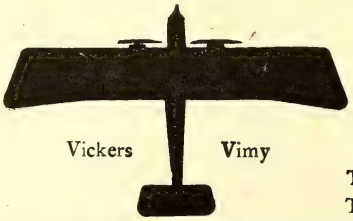
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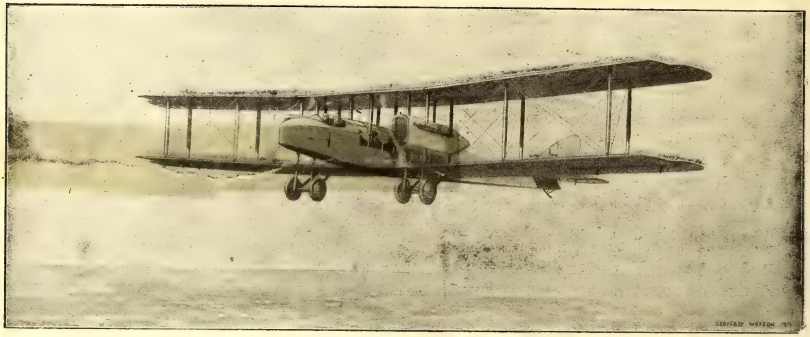
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THE WEEKLY COMMENTARY.

This week the article on "Commercial Aircraft Design" by Capt. Sayers is held over to give space to a *resumé* of a lecture on "Commercial Aeronautics" given at the Institution of Junior Engineers by Mr. J. D. North, A.F.R.Ae.S. He points out that at present commercial flying is more or less in its infancy, and that its prospects as outlined in the lay press have been considerably exaggerated, but by careful organisation a very great future presents itself from the commercial point of view. He discusses navigation, depreciation, expense, etc., in a simple manner.

A few interesting notes on parachutes, written by the late Mr. W. L. Wade, appear in this issue. This appears rather apposite, in view of the fact that parachutes will eventually form a necessary part of the equipment of all aircraft.

The death of the Press Bureau permits one to describe the work of Mr. Chessborough J. H. McKenzie-Kennedy, late of Petersburg, and the publication of some interesting photographs and particulars of the Kennedy biplane which was built entirely in the open at Northolt. Owing to lack of support from the War Office, it was never supplied with engines of sufficient power to prove the capabilities of the big twin-engined machine.

The description of machines built by Armstrong-Whitworth, Ltd., is a continuation of the series on "Modern British Aeroplanes."

A DESIGNER'S VIEW OF COMMERCIAL AERONAUTICS.

It is a habit of the Institution of Junior Engineers to hold on Friday evenings a series of informal meetings at which some member or visitor reads a short paper on some subject of general interest which is afterwards discussed by those present, to the accompaniment of pipes and coffee, with an absence of ceremony which is in very marked contrast to the usual type of formal discussion indulged in by most of the learned societies.

The result of this absence of formality is that those who know little or nothing of the subject, but who wish to learn, are encouraged to take part in the discussion and to ask questions rather than that the discussion should be confined to those who are, or who consider themselves to be, authorities upon the subject.

At the meeting held on the evening of April 25th, Mr. J. D. North, the technical chief of Boulton & Paul, Ltd., of Norwich, presented a paper on "Commercial Aeronautics" which deserves a wide publicity, on account of the cheerful and sane pessimism as to the immediate future of commercial aviation therein displayed.

Mr. North's opening passages are quoted *in extenso*:—

"The Psalmist has said, 'Prophecy is left to children and to fools,' and anything which savours of the prophetic is justly regarded with suspicion.

"We have had many and weird glimpses presented to us of the prospects of civil aviation. Here we are told that flying is only for millionaires; there we read that the air will soon be black with the aeroplanes of *hoi polloi*.

"Not unnaturally, we are somewhat bewildered; in a multitude of counsellors there may be wisdom, but it seems that there is also confusion of thought. (In some cases behind the picture of optimism do we not see the shadow of the company prospectus?)

"If I am asked to foretell the future of commercial flying I must cry off—I do not know what will happen. I would rather show you an outline of the present, and let you fit in the rest for yourselves.

A Simile.

"Imagine the world's shipping without harbours, without lights, without charts, its development having been almost entirely due to war necessity. Destroyers preponderating. Big ships in their infancy. All thickly enmeshed in the net of official control.

"Astute financiers visioning gigantic liners, not yet built, carrying the world's travellers, the world's goods; lesser minds scheming coastal trips in the 'Skylark' at 5s. a head.

"Millions to be spent before these ambitious schemes can become an accomplished fact, and national capacity for expenditure on new ventures at a minimum.

"And yet beneath everything a sound basis of commercial advantage lies, for 'transportation is civilisation.'"

Of Speeds and Speeds.

Dealing with the technical difficulties of successful commercial aviation, Mr. North drew attention to the error of imagining that the time taken by an aeroplane to travel between two points was the straight line distance divided by the maximum speed as was so often conveniently assumed. To maintain an average speed of 100 m.p.h. he suggested that a maximum of 140 to 150 m.p.h. was necessary.

This was due to adverse winds, errors in navigation, and like troubles.

The fuel costs of a machine with a large speed margin and normally run with engines throttled down was very slightly greater than that of a machine which had always to be run full out, and the gain in engine reliability entirely outweighed the extra cost.

If modern engines were normally run at one-half to two-thirds their full power, their reliability would be sufficient for commercial purposes.

Twin Engines and Unreliability.

Twin-engined machines which had not sufficient reserve power to complete their journey on one engine were just twice as unreliable as a single-engine machine with the same power reserve.

By completing the journey he did not mean barely stagger home at just on stalling speed, but maintain a reasonable approach to the normal schedule air speed.

There was at the moment no conclusive evidence that water-cooled engines were necessarily more reliable than air-cooled.

Except in regard to the petrol system, he considered that the modern aeroplane itself, properly looked after, might be regarded as 100 per cent. reliable, and that most petrol system troubles could be avoided if gravity petrol feeds were always used.

In other words, a properly designed, properly maintained, and carefully run aeroplane should "get there" every time, if the navigation is good.

Serious aerial navigation was only just beginning.

Navigation the Difficulty.

In good weather, where the ground was visible, navigation was simple. In fog or haze it was far from it. Compass readings were not reliable, since a swing of the course would often set a compass spinning, and with no visible landmark to get onto a steady course it was very difficult to settle down to any straight course and bring the instrument to rest.

Turn indicators, consisting of two pressure heads fixed to the machine and pointing at equal angles on each side of the centre line, connected one to each side of a sensitive pressure indicator similar to an air speed indicator would show the direction of a very slight turn, and by carefully watching such an instrument and correcting every divergence immediately it occurred a pilot could keep on a steady compass course even in fogs.

Keeping on a compass course did not solve the difficulty entirely, owing to wind drift.

Drift Measurement.

Where the ground was clearly visible it was possible to observe the apparent motion of any fixed object on the earth which would give the true course over the ground, and to time the object over a scale which would give the ground speed. Knowing these, the true wind speed could be arrived at by a mechanical application of the triangle of velocities, and the correct compass course could be laid.

Unfortunately, owing to vibration and the consequent errors of observation, this method was very inaccurate at any height over 6,000 feet even in clear weather, and a very slight haze would render it useless at much smaller heights. In fog it was obviously useless.

Corrections for drift might be made by measurement or careful forecast of the upper winds. Over land winds could be measured by observation of pilot balloons if the weather were sufficiently clear.

Over open sea fairly accurate forecasts might be made from meteorological data in some cases.

Directional Wireless.

Directional wireless had been used for aerial navigation, but was still in an experimental stage. By the use of an instrument known as a radio-goneometer it was possible to find the bearing of a wireless-sending station, and consequently to keep the machine heading for that station. With a cross wind, particularly with a cross following wind, the course so set might be an extremely long one.

By using two stations and obtaining the bearing of each, it was possible to determine the actual position of the machine relative to the stations from time to time, and thus find the actual course of the machine.

The accuracy of the bearings so obtained varied with different operators, but was not often better than from 1 deg. to 2 deg.

Aerial Lighthouses.

Vertical searchlights could be seen through a haze or fog which entirely veiled the ground, and the development of a system of aerial lights of this nature would greatly assist navigation in fogs and mist.

There was no evidence that a sextant had ever been successfully used in the air. Something of the nature of an artificial horizon would be necessary, and probably vibration troubles would render the inaccuracy large.

Depreciation.

As to the depreciation of machines in use, Mr. North said that the experiences of the last four and a half years had actually provided a vast amount of data on the subject, and that were a competent body of statisticians set to work on the records of the Air Forces during that time it would be perfectly possible to arrive at extremely useful results, provided that due allowance for the extravagant methods of officialdom were made in the process.

His own experience was that engines required frequent overhaul, but, given that, would continue to run for a very long time.

The Most Expensive Item.

The fabric covering of an aeroplane was the most expensive item in its maintenance.

It required frequent renewal or redoping, which was almost as expensive.

Tyres cost very little if of reasonable size. In many machines for military work the tyres had been cut down to the last ounce for the sake of extra performance, and tyre bursts were frequent. This was not necessary for commercial purposes.

The only serious cause of deterioration in the structure of the present-day aeroplane, other than accident, was warping of the wood parts.

This trouble could be avoided by the use of metal construction, and there were hopes that a substitute for fabric and dope might be available in the near future.

Metal Construction.

With metal construction there was no appreciable saving in weight to be looked for, and there were serious constructional difficulties.

If high tensile steels were used, there was no difficulty in providing against primary stresses, but the very thin sections which would meet these stresses were not sufficiently stiff against secondary stresses, and would usually fail by buckling in the flanges. This could be met by corrugating the flanges, calling for special rolling and some increase in weight.

A light alloy construction overcame this difficulty at a very large cost for materials.

At the same time the difficulties of steel construction had been overcome, to the extent that it was possible to build wing spars for even a machine of the size of a Standard "Avro" at no serious increase in weight, and at a reasonable cost, if the production were on a large enough scale.

[One learns that a complete Avro wing with steel and fabric only in its construction has been made which is lighter than a wooden wing.—Ed.]

Col. Ogilvie's Views.

In the discussion Lieut.-Col. Ogilvie said that, in his view, even for a machine of the size of an Avro, metal structure could be made lighter and stronger than wood, and that he believed that by its use it would become possible to build machines of a total weight of from 80,000 to 100,000 lbs. with a structure weight of from 30 to 33 per cent. of the total.

At the same time he dissented strongly from the view, held in some quarters, that the fact that an aeroplane was mainly built of wood put it beyond consideration

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as a serious engineering job. He believed the aeroplane represented in the highest degree the art of structural design.

As to engines, he (Col. Ogilvie) believed that the air-cooled engine would eventually be found more reliable than the water-cooled type.

Regarding the running of engines at less than their maximum horse-power, he believed that the correct method of attaining the desired result was to detune engines, by altering their valve timing and so forth, so that they could not be run at their maximum possible output.

SOME NOTES ON PARACHUTES.

The article which appeared in a recent number of The Aeroplane on the subject of "Life-Saving in the Air" in general, and on parachutes in particular, has aroused some discussion, particularly among inventors and others who would like to contribute to the knowledge which is available concerning aerial safety appliances. It may be useful, therefore, to offer a few hints to those who are possessed with an inventor's longings.

In the first place, it should be remembered that the parachute problem is being investigated by the Air Force Technical Department, and that this Department is in possession of all available knowledge concerning previous experiments with the various forms of apparatus, and that, although in the minds of the inventors concerned a certain idea may appear to be revolutionary, it is possible that such ground has already been covered, although no record may be found in the Patent Office.

The principal object in equipping aircraft with parachutes is to inspire confidence in those who use the aircraft, and, therefore, parachutes must be so constructed as to leave no doubt in the minds of aviators as to the certainty of their operation. That is to say, no parachute will become popular which includes in its construction a large number of small and delicate moving parts upon the successful working of which the unfolding of the parachute depends.

What is Wanted.

At the present time various parachutes exist which are extremely simple in their packing and method of operation, and no new parachute can hope to compete with these, no matter how great its ingenuity, if its action is so complicated as to lead an aviator to fear that it might not work at the critical moment.

For this reason parachutes which are liberated from an aeroplane with the aid of compressed air, springs, or explosive charges will not receive recognition, because there would always be suspicion in the mind of the aviator that the compressed air might leak prematurely, that the explosive charge might fail to explode, or that the springs might jamb or break.

Also, the action of the apparatus must be positive. That is to say, it should leave the aeroplane progressively, and not in a heap, and that all the time there should be some definite natural force tending to force it open. Obviously the most accessible form of natural force is the air through which the aeroplane is passing.

So far as people are concerned who have not full access to all the research work which has already been done concerning parachutes, there would appear to be a wider field for experimentation where minor improvements applicable to existing parachutes are concerned. There is still a wide field for ingenuity in the discovery of improved methods of folding, simple arrangements for ensuring the positive opening of parachutes, systems of avoiding entanglement of rigging, improvements in the comfort, safety, and quick detachment of the harness, devices for saving weight and reducing packing space, and improvements in the arrangements in, and ejection from, the aeroplane or airship.

There is little demand for a decrease in the necessary time required for opening, as some existing parachutes open so quickly that there is distinct danger of the parachute fouling the machine, and devices which would ensure the positive opening of the parachute at a pre-determined *minimum* distance would be welcomed.

On a good many occasions the problem of fitting an aeroplane with a parachute sufficiently large to take up the weight of the whole machine has been discussed. Time should not be wasted in experiments along this line, because a parachute of sufficient size to support the weight of an aeroplane would absorb too great a proportion of the stowage capacity and lifting power of the machine.

Soaring Parachutes.

Another line of thought which has received much attention is the possibility of ejecting an aviator upwards from his machine in such manner as to extract him from his seat by the pull of the parachute. No matter in what attitude the parachute opened itself, it would not, unless the machine was completely stalled, commence to extract the pilot until the vertical axis of the parachute was in line with the direction in which the machine was flying. This would apply if the aeroplane were flying horizontally or diving at any angle down to vertical, with the net result that the pilot would be decelerated from a speed of anywhere between 60 and 140 miles per hour to a speed of practically zero, almost instantaneously, and no shock-absorbing devices which can be conceived would be sufficient to secure him from harm. Even assuming that the parachute was attached to a detachable portion of the aeroplane and not to the pilot, the jerk would be so sudden that it would probably break his neck. On the old principle that it is not a fall which injures a man but the sudden stop, the effect of the opening of the parachute would be practically the same as if the aeroplane had charged into a brick wall.

Possibly this difficulty might be overcome by the employment of a pilot parachute—one imagines that an appliance about the size of an umbrella would be sufficient to eject an aviator from a fast-moving aeroplane—but such an arrangement would certainly introduce complications, and complications must be avoided.

Positive Opening.

Reference has already been made to positive acting parachutes. This applies to parachutes which extend in such a way that the rigging end of the parachute remains attached to the aviator, while the apex of the parachute remains attached to the aeroplane until the parachute is fully extended, the relative motion between the falling aviator and the aeroplane being the force which extends the parachute. Parachutes of this character tend naturally to inspire the highest degree of confidence in those who have to use them.

The non-positive types are usually those in which the parachute is packed upon the aviator's person and leaves the aeroplane with him, depending for its opening upon the entry of air into its mouth by inflation caused by the fall. Although this type has much to recommend it—for instance, the obvious advantage of being stowable about the person of the individual for whom it is intended (a very great advantage in the case of aeroplanes carrying large numbers of passengers) the precarious principle on which its opening depends is not such as to inspire confidence.

It is hoped that a study of these remarks will throw some light onto a rather obscure problem, the final solution of which cannot be obtained without a proper enunciation of the requirements.—W. L. W.

SOARING FLIGHT IN FANCY—U.S.A.

According to a communication received from the Cantilever Aero Co., of New York, who are the makers of the Christmas "Bullet,"

". . . . Dr. William Whitney Christmas, although only 52 years of age, is the oldest living investigator of aerodynamics in the United States. . . . . ."

". . . . In 1898 he designed and successfully flew a monoplane, and was soon followed by a biplane."

One cannot help feeling that he is quite old enough to know better, and that it is a matter for regret that the biplane which followed him didn't catch him.

It is also stated that Dr. Christmas was "so convinced . . . . that the future of aviation was in the development of bird form in heavier-than-air machines . . . . that he lay on his back for many hours each day for a year and a half studying one single peculiarity exhibited in a bird's wing while in flight."

One is inclined to discredit a rumour to the effect that Dr. Christmas was the originator of the well-known exclamation, "Ciel! que les vaches ne volent pas," for it would then be unthinkable that he should have failed to notice that one thing which a bird never drops in its flight is its wings.

According to the same authority the Cantilever Aero Co. has started to build a Christmas machine of 180 ft. span, of 3,200 h.p. and of a gross weight of 30 tons.

This machine is "to make a non-stop flight across the Atlantic, starting from New York, and landing within perhaps 35 hours either in Queenstown, Ireland, London, England, or Brest, France."

"Each feature of design, every part . . . . has been gone over not less than one hundred times."

"A prominent and vital feature——in this 'Christmas' model is the arrangement of its motors. They are connected in such a way that should one inadvertently be put out of commission, the operation of the machine will not be affected in the smallest degree."

This being the case, it is difficult to see why two, three, or four motors out of commission should produce any effect—so one would recommend their total omission.

Perhaps the omission would have to be inadvertent—but even this might be arranged. It is so much safer to forget one's engines than one's wing bracing.

Incidentally the writer of this screed, modestly described as "what seems to us to be an interesting news story," further assists in the process of improving the performance of the Christmas "Bullet"—to which attention was drawn in this paper some weeks ago—by raising the speed to 200 m.p.h.

This is rather a falling off in progress—merely an extra three miles per hour—but, on the other hand, the reference to "the terrific vibration of this machine whizzing through the air at 197 miles per hour" has been omitted—inadvertently, one feels sure.

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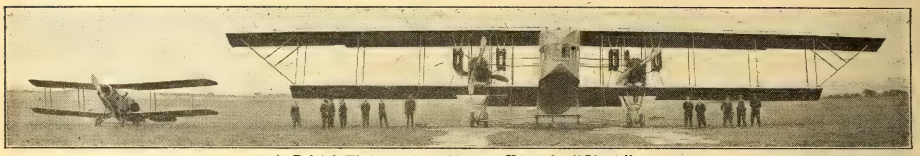
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HE KENNEDY AND ALLIED AIRCRAFT ORGANISATIONS.



A Bristol Fighter alongside the Kennedy "Giant."

Those who knew aviation in its early days will well remember Mr. Chessborough J. H. MacKenzie-Kennedy of Petersburg.

Mr. Kennedy is practically the pioneer of aviation in Russia. He went to Russia with the proverbial half-crown—or should it be half-rouble—in his pocket while still a youth and managed to carve out for himself a very successful business career. After some ten or eleven years in Russia he began, in 1907, to devote himself seriously to aviation, and it was very largely through him that the Russian Government took any interest in aviation at all before the war. Also he had much to do with the design and experimentation of the Sikorsky biplane, which was actually the first four-engined aeroplane to fly successfully.

Very soon after the outbreak of war he came to England in the hope of interesting our people in the construction of giant aeroplanes, more or less on Sikorsky lines, and he managed to secure in this country sufficient financial support to enable him to embark on the construction of quite a remarkable machine. This machine, a big biplane, was built at the works of The Gramophone Co., Ltd., of Hayes, and the parts when constructed were taken to the R.F.C. aerodrome at Northolt.

No shed was available to house such a giant, as may be gathered from the following specification :—Span 142 ft. ; length, 80 ft. ; height, 23 ft. 6 ins. ; chord, 10 ft. ; gap, 10 ft. ; total weight, 19,000 lbs. empty.

The machine was equipped with four 200-h.p. Salmson engines, which were the only type which the Government would issue. These were actually British-built engines turned out more or less experimentally, the Serial Nos. being 2, 6, 8, and 10.

One is not aware of the actual performance of each individual engine on test, or whether the whole four gave their estimated total of 800 h.p. satisfactorily, but in any case it appears that 800 h.p., even if obtained, would have been too little for the size and weight of the machine, and therefore it never progressed further than doing straight flights over the aerodrome. One gathers, however, that it actually upheld the theories which it set out to prove in the matter of weight lifted per h.p., and very probably if it had had a modern power-plant of 1,600 h.p. as the big machines of to-day have, it would have proved a success. It is quite an interesting effort and it has the distinction of being the only aeroplane in this country which has been assembled in the open without any shed accommodation or covering.

This machine was abandoned somewhere in 1917, but the calculations made for it and the knowledge gained from it have now been put to use in building another large aeroplane.

This has the following specification :—Span, 100 ft. ; length, 55 ft. ; height, 22 ft. ; estimated speed, 120-130 m.p.h. ; estimated useful load, 6,500 lbs., in addition to crew and fuel necessary for 500 miles.

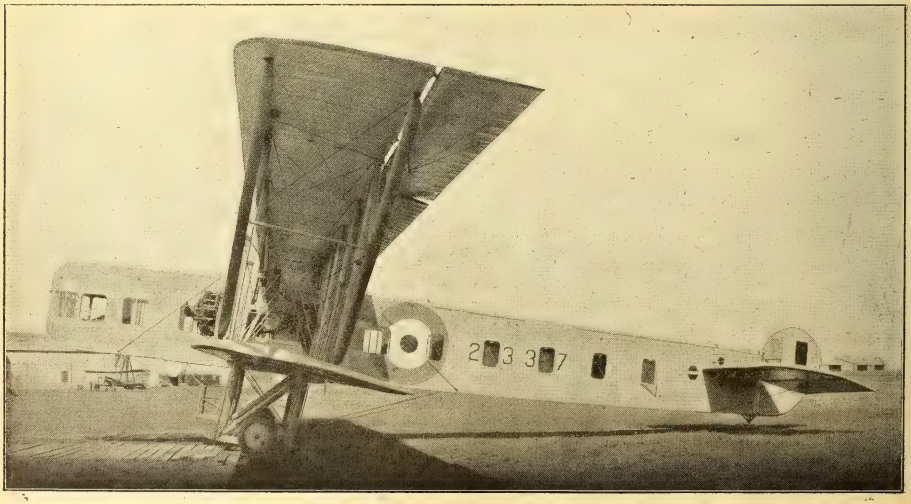
The machine is being built by John Dawson and Co., Ltd., of Newcastle-on-Tyne, the moving spirit in which is Mr. G. H. Humphrey, who is well known to most people in the Aircraft Industry as the chief of the Fairby Construction Co., Ltd., which has built some of the most successful, and certainly the most quickly produced, aircraft factories in this country.

Mr. Kennedy's ideas on the organisation of aircraft work deserve attention also because of their originality. He believes that the designing organisation of any aircraft venture should be entirely separate from production, and that each should stand financially on its own merits. The result is that his designing organisation is situated in a mansion at 102, Cromwell Road, South Kensington, S.W.7, which has been turned into an aeroplane design office on quite original lines, each department of design having its own particular set of rooms. Thus, there is a design department, a calculating department, a checking department, a big drawing office, an experimental department, a general management office, a financial office, and so forth.

The design organisation has to support itself either by selling its designs or by receiving royalties from its building or using licensees. The construction organisation, on the other hand, has to support itself by selling the aeroplanes either on the open market or to its allied transport organisations. Thus, the designing, constructing and operating organisations are actually separate companies, each of which is self-supporting.

Mr. Kennedy has secured for his design organisation a number of people with very considerable experience in aircraft design, among them Mr. T. W. K. Clarke, who is undoubtedly one of the pioneers of aviation in this country, Mr. E. A. Vessey, formerly of the Royal Aircraft Factory, and Mr. G. C. McLaughlin.

One gathers that adequate financial support has been secured for Mr. Kennedy's new ventures, and the development of his schemes will be watched with considerable interest.



Side View of the Kennedy "Giant."



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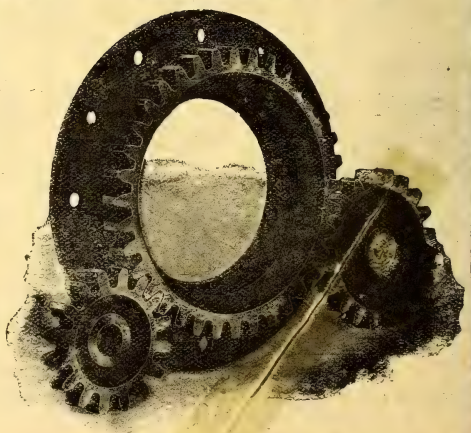
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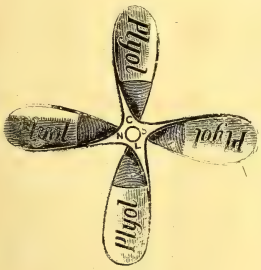
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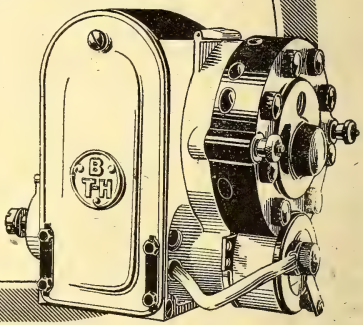
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Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830
British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selaero, Phone, London." Regent 1181.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

The Aeroplane

Accumulators—
The Chloride Electrical Storage Co., Ltd., Clifton Junction, near Manchester. "Chloride, Pendlebury." Central, Manchester, 1638 Pendlebury, 11.

Acetylene Welding Plant—
Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flammo, Vic, London." Vic 4830
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." 5340 Victoria (3 lines).

Aeroplane Manufacturers—
Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 220.
Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle - on - Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851
British Aerial Transport Co., Ltd. Head Office: 58, Conduit Street, London, W.1. "Batigram Reg. London." Mayfair 637, 638.
Works: Hythe Road, Willesden, London, N.W.10. "Aerbrirans, Phone, London." Willesden, 2272, 2273.
British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Cricklee, London." Hampstead 5551.
Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London" Hampstead 2493 and 4424.
Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2664 (2 lines).
Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176.
Glendower Aircraft Co., Ltd., 54, Sussex Place, South Kensington, S.W.7. "Glenaeelle, SouthKens, London." Kensington 7605 (3 lines)
Gosport Aircraft Co., Gosport. "Flight Gosport." Gosport 217.
Graham-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.
London Office, 12, Regent Street, S.W.1. Regent 2684.
Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophid, Crickle, London." Hampstead 7420.
Hooper & Co., Ltd., 54, St. James's, Piccadilly, London, S.W. "Sociable, St James, London." Regent 912.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 282 (4 lines).
Martinsyde, Ltd., Brookfands, Byfleet, "Martinsyde, Weybridge." Woking 331; Byfleet 171
"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London" Willesden 2455
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).
The Regent Carriage Co., Ltd., 226/232, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.
Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester" City 8550-8551, Manchester.
Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes" Cowes 193.
Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tusted, Phone, London." Regent 378.
The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954 "Deasy, Coventry."
Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston" Kingston 1088 (8 lines)
The Supermarine Aviation Works, Ltd., Southampton. "Supermarin." Woolston 37 (2 lines).
Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet" Byfleet 1, 2 & 3.
Thames Aviation Works, 141, Curtain Rd., E.C.2 London Wall 0766.
Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyte, Knights, London." Kensington 6510.
Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 1000.
Westland Aircraft, Yeovil "Aircraft, Yeovil." Yeovil 129.
White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Airships—
Airships, Ltd., High Street, Merton. Wimbledon 1314.
Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 378
C. G. Spencer and Sons, Ltd. (See under "Balloons").

Air Transport—
British Aerial Transport Co., Ltd. Head Office: 58, Conduit Street, London, W.1. "Batigram Reg. London." Mayfair 637, 638.
Works: Hythe Road, Willesden, London, N.W.10. "Aerbrirans, Phone, London." Willesden, 2272, 2273.

Aluminium Castings (Sand and Die)
Coan, R. W., 219, Goswell Road, London, E.C.1 "Krankases, Isling, London." City 3846.

Balloons—
C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N 5. "Aeronaut, London" Dalston 1893.

Bent Timber Parts—
Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London" Museum 466.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Bearings (Etonia Cast Phosphor Bronze)
Brown Bros., Ltd., 61, Eastern St., E.C.1. Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927.

Blinds—
J. Avery & Co., 81, Gt. Portland Street, London, W. "Velarium, London" Gerrard 6620

Blowpipes (Oxy-Acetylene)—
Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic. 4830
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic 5540 (3 lines)

Bolts—
Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N 16 Dalston 2500 (2 lines).

Books (Aero Engines)—
Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2

Buildings—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851
Rubery, Owen & Co., Darlaston, South Staffs.

Cable Coverings and Cable Controls—
The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green." Acock's Green 103 & 104
Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—
Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2 Victoria 4070

Casein—
Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricodon, Fen, London." Avenue 34 and 35

Clothing—
Burberry's, Ltd., Haymarket, S.W.1 Regent 2165.
Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

Component Parts—
Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury." Oldbury 111 (4 lines).
Brown Bros., Ltd., 61, Eastern St., E.C.1.
Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 4493 & 4494
P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Acros, Richmond." Richmond 1681.
Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England "Thompsons, Bros., Bilston." Bilston 40.

Cords, Tapes, and Threads—
MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow City 3115.

Dopes—
Titanine, Ltd., 175, Piccadilly, W.1 "Tetrafrez, Piccy, London" Gerrard 2312
British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellulate, London" Regent 3046
The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London" Gerrard 289
Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawh, Rec, London." Gerrard 340.
Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.

Engines and Parts—
Allen, W. H., & Co., Ltd., Bedford "Pump, Bedford." Bedford No. 1
Arrol-Johnston, Ltd., Dumfries "Mocar, Dumfries" Dumfries 201-202.
Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London" Gerrard 238
The Cosmos Engineering Co., Ltd., Fishponds, Bristol.
Dudbridge Iron Works, Ltd. (Salmson), 57, Victoria Street, London, S.W.1. "Aeroflight, Vic, London" Vic 7026
Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge." Weybridge 550 (7 lines).
Green Engine Co., Ltd., Twickenham Richmond 1203
Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1010.
Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London" Gerrard 8976
Rolls-Royce, Ltd., 15 and 15, Conduit Street, W.1 "Rolhead, London" Gerrard 1634-5-6.
The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."
Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 585.
The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 211 (2 lines).
Walton Motors, Ltd., Walton-on-Thames "Motors, Walton-on-Thames" Walton-on-Thames 220.

Electrical Accessories—
Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1064.
Brown Bros., Ltd., 61, Eastern St., E.C.1.
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London" Central 2207; London Wall 1564.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W.1. "Installing, Euston road, London" Museum 70.
Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham "Fahrenheit, Birmingham" Midland 624.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London" Willesden 2480.

Electric Cables—
E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 248.
Johnson & Phillips, Ltd., Charlton, London, S.E.7 "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—
Johnson & Phillips, Ltd., Charlton, London, S.E.7 "Juno, London"
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston road." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—
W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

Flare Lights—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1 "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61.

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Fluxes—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).
The Auto Controller Co. (Finaxite), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Furniture (Office)—
Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6179.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0160

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mossgear, Birmingham" Salop." East 407.

Glue—
Cannon, B., & Co., Ltd., Lincoln. London office, 110, Cannon Street, E.C.4. "Boscolin, Cannon, London" City 1206.
Improved Liquid Glues Co., Ltd., 61, Hermitage Street, E. (Croid) "Excroiden, 'Phone, London" Avenue 4011-2
Meadow Co., S., Arthur Street, E.C. Bank 5873.

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London" Regent 1340.

Hack Saw Blades and Machines—
Victor Saw Works, Ltd., 2 and 3, West Street, Finsbury Circus, London, E.C. "Victaw, 'Phone, London." London Wall 1880.

Heating and Ventilating—
Chas. F. Kennell and Co., Ltd., 65 & 651, Southwark Street, London, S.E.1. "Kennell, London." Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 703.

Instruments—
British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London" Walthamstow 180.

Insurance—
Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 9034.
Bray, Gibb & Co., Ltd., 160, Piccadilly, W.1.
Neville & Sons, Duchy Chambers, 4, Clarence Street, Manchester.

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London "Pegamoid, Cent., London" City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—
W. B. Tuck & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London Avenue 7854 (2 lines.)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 254, Tottenham Court Road, W.1. "Vicksmag, Phone, London" Museum 430.
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asbrotidal, Coventry." Coventry 278.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 999 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—
Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon, London" City 6342.

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury" Oldbury 111 (4 lines)
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Gt. Eastern St., E.C.1
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1 "Installing, Eusroad, London." Museum 70.
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London" Holborn 410.
The Seledon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Sclaero, Phone, London." Regent 1181.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros, Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 3033-3034-3035.
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham" Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Eusroad, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry" Coventry 510 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1 "Shatterlys, Piccy, London." Regent 1340.

Oils—
Anglo-American Oil Co., Ltd., 36, Queen Anne's Gate, London, S.W.
C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London" Central 11305 & 13466

Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.
C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—
British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield" Sheffield 2149

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich" Norwich 851.
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames "Ebora, Kingston." Kingston 672.
Integral Propeller Co., Ltd., "Avipro, Hyde, London" Hendon 9. Kingsbury 104
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil" Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth" Letchworth 29

Rawhide Hammers—
Ira Stephens, Whitelands Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton" Ashton 709.

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 209, Goswell Road, London, E.C.1 "Masticator, Isling, London." City 3811 & 3812

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0160

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Invincors, Redditch" Redditch 74.

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 647.
Supermarine Aviation Works, Ltd., Southampton "Supermarin, Southampton" Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London" 5340 Victoria (3 lines)
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London" Willesden 2480.

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830
British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.
Rubery Owen & Co., Darlaston, South
The Seledon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Sclaero, Phone, London." Regent 1181.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

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Solder Manufacturers—

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Sparking Plugs—

Brown Bros., Ltd., Great Eastern St., E.C.1
Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Robinhood Engineering Works, Ltd., Newlands, Putney Vale, S.W.15. Makers of K.L.G. Plugs. "Kaelgee, Phone, London." Putney 2132-3.

Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines)

Steel—

Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 221.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield." Central 4522-3-4.

Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Tapes and Smallwares—

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 1115.
C. E. Matthews & Co., Ltd., Castle Works, Bermondsey Square, S.E.1. "Webbance, Berm, London." Hop 4058.

Timber—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London." Museum 496.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Time Recorders—

Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—

Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349.

Turnbuckles—

Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery Owen & Co., Darlaston, South Staffs.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston." Museum 70 (4 lines).

Tyres—

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Central 3880 (5 lines).
The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Varnishes—

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjap, Phone, London." Mayfair 6347 (3 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Welding and Cutting Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London" Vic 4830
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Welding Repairs—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac," Phone, London" Victoria 3540 (3 lines).

Wind Shields—

Auster, Ltd., 133, Long Acre, W.C. "Windfector, London" Regent 5010.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London" Willesden 2180.
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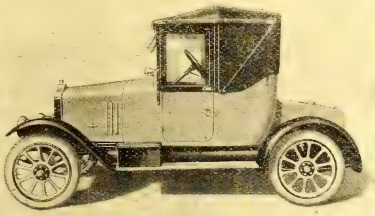
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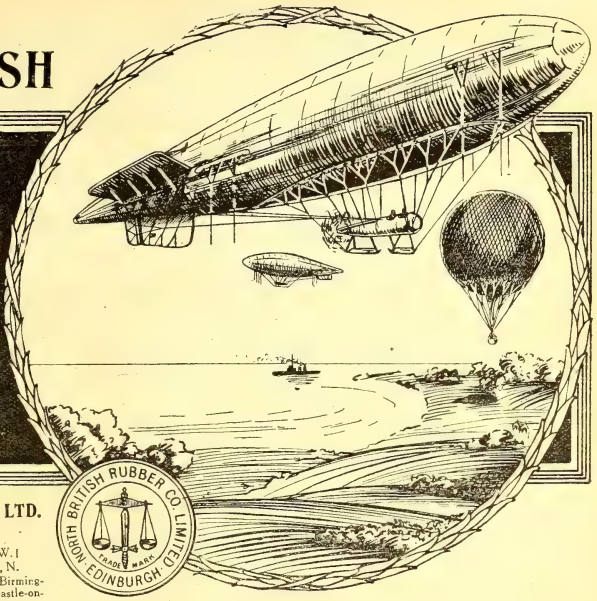
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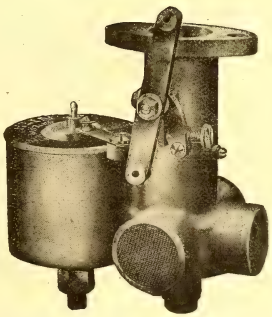
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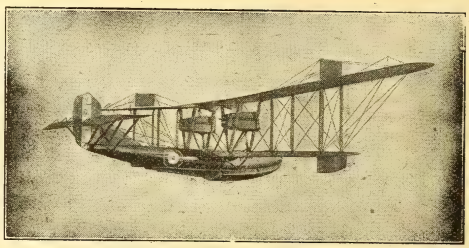
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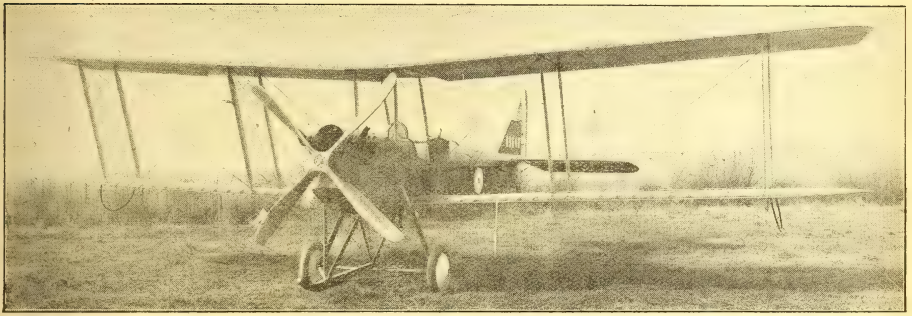
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MODERN BRITISH AEROPLANES.

II.—Armstrong-Whitworth, Ltd.



Three-quarter Front View of the Armstrong-Whitworth F.K.3 (90 h.p. R.A.F. Engine).

The following notes deal with the Aircraft Works of Sir W. G. Armstrong, Whitworth and Co., Ltd., of Gosforth, Newcastle-on-Tyne (Aeroplane Works), and Barlow, nr. Selby (Airship Works).

Captain I. F. Fairbairn-Crawford, who is general manager of the aircraft department, founded the aeroplane department in 1913 and the airship department in 1915. Lieut.-Commander R. G. Lock, R.N., is assistant to the general manager. Mr. F. Murphy is chief designer and works manager of the aeroplane department, Gosforth. Mr. H. H. Golightly is works manager of the airship department, Barlow Aircraft Works, Selby.

Both departments have been working at full pressure during the period of the war, and over 1,300 aeroplanes for military purposes and three large rigid airships for the Navy have been completed and delivered.

The following types of aeroplanes have been delivered:—

B.E.2a., B.E.2b., B.E.2c., biplanes to R.A.F. design.

The 70-h.p., 90-h.p., 120-h.p., and 160-h.p. F.K. type Armstrong-Whitworth two-seater biplanes, which were designed by Mr. Frederick Koolhoven.

A 250-h.p. triplane.

Several 130-h.p. quadruplanes.

220-h.p. B.R.2, F.N.type, single-seater scout biplanes. (The "Armadillo.")

320-h.p. A.B.C., F.M. type, single-seater scout biplanes. (The "Ara.") Etc., etc., etc.

The following Naval rigid airships.

H.M.R.25, with four 250-h.p. Rolls-Royce engines.

H.M.R.29, with four 250-h.p. Rolls-Royce engines.

H.M.R.33, with five 270-h.p. Sunbeam engines.

Cars for fifteen S.S. and coastal type non-rigid airships.

Larger rigid airships are in course of construction and design.

THE ARMSTRONG-WHITWORTH F.K.3.

The Armstrong-Whitworth was designed by Mr. Frederick Koolhoven, and was built at the time when B.E.2cs were being produced in large numbers and was an improvement on this type of machine.

In general apearance there is very little difference from the B.E.2c, the fuselage being of the same long, narrow type, with the exception that the pilot is placed in front of the observer, who is equipped with a swivel gun-mounting.

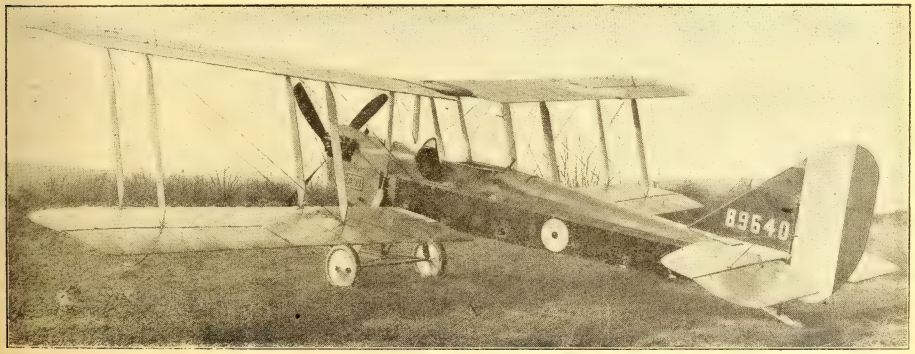
A 90-h.p. R.A.F. air-cooled engine is carried in the nose.

The undercarriage consists of an axle hinged in the middle to a central skid which is carried in two Vees from the fuselage, the two side struts from the axle being mounted on oleo-pneumatic shock-absorbers inside the fuselage.

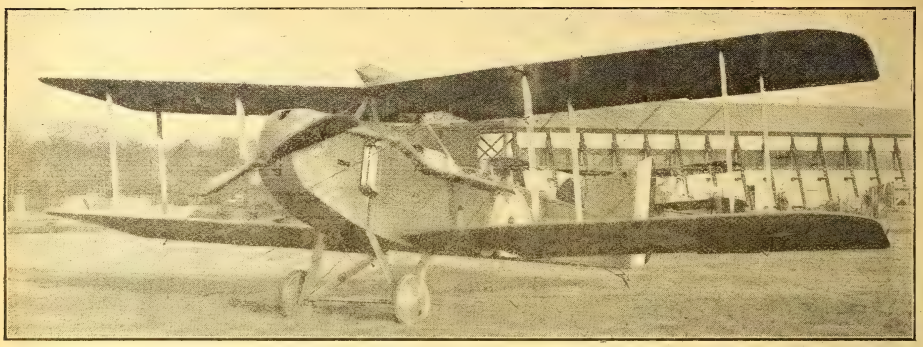
The main planes are staggered with a wide gap, and have two sets of struts on each side of the fuselage. The rudder is balanced. The machine was used on active service for some time, but was eventually used as a training machine in conjunction with the B.E.2c and d.

SPECIFICATION.

Type of machine	Two-seater Biplane.
Name or type No. of machine	Armstrong-Whitworth F.K.3.
Purpose for which intended	Sport and Training.
Span	46 ft.
Overall length	28 ft. 8 ins.
Maximum height	10 ft. 2½ ins.
Engine type and h.p.	90 h.p. R.A.F.
Weight of machine empty	1,900 lbs.
Tank capacity in hours	3½ hours
Performance—	
Speed at 1,000 feet	85 m.p.h.
Landing speed	38 m.p.h.
Climb—	
To 10,000 feet	23 mins.



Three-quarter Rear View of the Armstrong-Whitworth F.K.3 (90 h.p. R.A.F. Engine).



Three-quarter Front View of the Armstrong-Whitworth F.K.8 (160 h.p. Beardmore Engine).

THE ARMSTRONG-WHITWORTH F.K.8.

The Armstrong-Whitworth F.K.8, also designed by Mr. Koolhoven, was a heavier and improved F.K.3. It had a deeper fuselage, a similar type of undercarriage except that the central skid was cut short in front of the front Vee, and a 120-h.p. Beardmore engine was enclosed in a cowling, with two radiators, one on either side of the fuselage and meeting in the form of an inverted Vee at the upper plane.

There is no centre section, the two upper planes being attached to two inverted Vees over the fuselage.

This machine was used to a large extent on various fronts for contact patrols, artillery spotting, light bombing, photography and reconnaissance work up to the signing of the Armistice, although it was gradually being superseded by machines of improved design.

About half-way through its active service life the F.K.8 was slightly modified by having a Vee-type undercarriage fitted and the engine mounting altered to take a 160-h.p. Beardmore; smaller radiators of improved efficiency, fitted on the sides of the fuselage only. A long exhaust pipe was also added to carry the exhaust fumes well clear of the crew.

Accommodation was made for two guns, camera and wireless installation to be carried.

SPECIFICATION.

Type of machine	Two-seater Biplane.
Name or type No. of machine	Armstrong-Whitworth F.K.8.
Purpose for which intended	Military and Commercial.
Span	43 ft. 4 ins.
Overall length	31 ft.
Maximum height	10 ft. 6 ins.
Engine type and h.p.	160 h.p. Beardmore.
Weight of machine empty	2,500 lbs.
Tank capacity in hours	3½ hours.
Performance—	
Speed at 1,000 feet	104 m.p.h.
Landing speed	45 m.p.h.
Climb—	
To 10,000 feet	17½ mins.

THE ARMSTRONG-WHITWORTH "ARMADILLO."

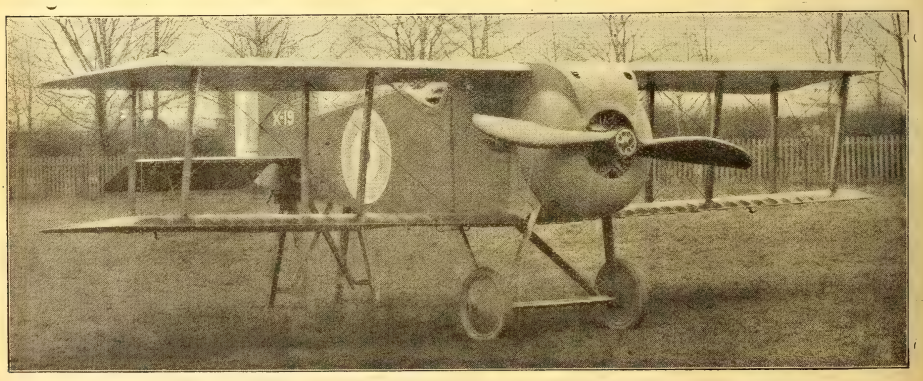
This machine was designed as a single-seater fighter and was produced about the middle of 1918, the trial flights taking place in September of that year.

The chief characteristics of the machines are a square fuselage and the top plane resting on the upper longerons. Two pairs of interplane struts are fitted on each side of the fuselage.

A 200-h.p. B.R.2 engine is carried in the nose of the fuselage and is enclosed in a circular cowl in the top of which is a pecuniar box-like hump, which is actually a continuation of the upper part of the fuselage brought round and finished off on the cowling. In this box-like arrangement are two fixed Vickers guns, mounted to fire through the airscrew with the usual form of fire control gear.

SPECIFICATION.

Type of machine	Single-seater Biplane.
Name or type No. of machine	"Armadillo" (1918).
Purpose for which intended	Military and Sport.
Span	27 ft. 6 ins.
Overall length	20 ft.
Maximum height	7 ft. 10 ins.
Engine type and h.p.	220 h.p. B.R. 2 Rotary.
Weight of machine empty	1,900 lbs.
Tank capacity in hours	2¾ hours.
Performance—	
Speed at 1,000 feet	140 m.p.h.
Landing speed	55 m.p.h.
Climb—	
To 10,000 feet	4½ mins.



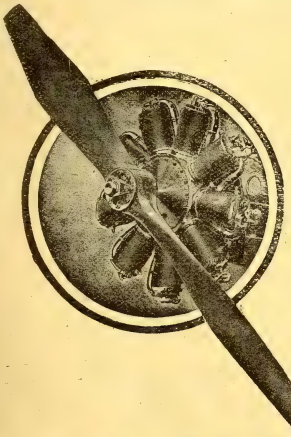
Three-quarter Front View of the Armstrong-Whitworth "Armadillo" (220 h.p. B.R.2 Engine).



ARMSTRONG, WHITWORTH

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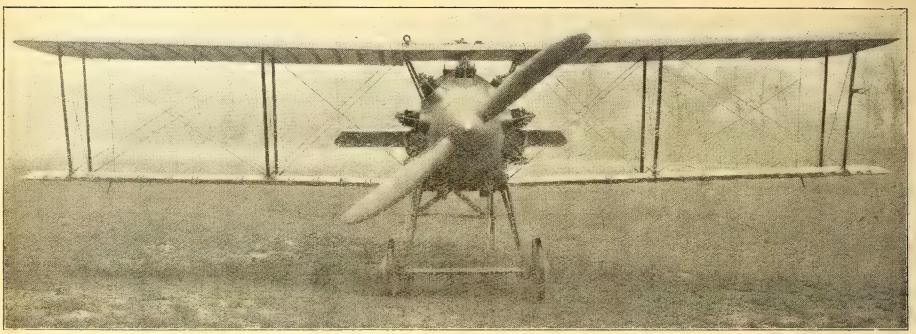
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Front View of the Armstrong-Whitworth " Ara " (320 h.p. A.B.C. Engine).

THE ARMSTRONG-WHITWORTH " ARA."

The Armstrong-Whitworth "Ara," although it was not produced until early this year, was designed as a single-seater fighter, but can be easily adapted as a sporting machine for one who desires something more than the low-powered, slow-speed machines which are being introduced by many firms at the present time.

The fuselage is of square section and carries a 320-h.p. A.B.C. "Dragonfly" engine in its nose, which is covered in by a conical cowl leaving the cylinder heads protruding, a continuation of the cowl forming a spinner on the propeller boss.

An ordinary vee-type undercarriage is fitted. The upper plane is placed very low over the top of the fuselage thus giving the pilot an excellent view upwards.

SPECIFICATION.

Type of machine	Single-seater Biplane.
Name or type No. of machine	" Ara " (1919).
Purpose for which intended	Military and Sport.
Span	27 ft. 6 ins.
Overall length	20 ft.
Maximum height	7 ft. 10 ins.
Engine type and h.p.	320 h.p. A.B.C. "Dragon-fly."
Weight of machine empty	1,900 lbs.
Tank capacity in hours	3¾ hours.
Performance—	
Speed at 1,000 feet	150 m.p.h.
Landing speed	55 m.p.h.
Climb—	
To 10,000 feet	5½ mins.

ITALIAN NOTES.

The Viennese having seen them and probably taken excellent photos of them, it is now permitted to point out a few of the characteristic features of the S.V.A. machine designed on plans (suggested of Savoia and Verduzio one has seen it stated) by Ing. Brezzi of the Ansaldo firm, the biggest concern of its sort in Italy and perhaps in Europe.

The wing shape of this smallish scouting biplane is of very low aspect ratio with a greater span to the trailing edge than to the leading edge. Squareness seems almost to have been aimed at in the designing of the wings as in the nose of the machine while the upper surface of the body is unusually streamlined and quite distinctive. The engine is the vertical S.P.A., and the latest type is said to do 250 kilometres (say, 160 miles), an hour.

The type now in use has a small dihedral to the lower plane which is cut away round the body for visibility. There is no stagger and there are ailerons only on the upper plane. Deep fuselage, plenty of side area, and a generously proportioned tail of fairly normal design are features of the machine. These were the machines which photographed Friederichshafen. There are two types, merely varying in size and engine power. The relative absence of wiring and the tubular struts are perhaps the technical talking points. Anyhow, speed and a big radius of action have been produced, which is most of what one needs

T. S. HARVEY.



The Armstrong-Whitworth " Ara " 320-h.p. A.B C. " Dragonfly."

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THE PATENTS INDEX.

The subjoined list of recent inventions has been specially compiled by The Aeroplane from the Current Official Patents Records :—

Patents Applications.

Ayscough, H. H. Device for compressing air on aircraft. No. 8747. April 7th.

Ayscough, H. H. Reservoir for accumulating and heating compressed air on aircraft. No. 8748. April 7th.

Chapman, H. E. Level-indicators for aircraft, etc. No. 8879. April 8th.

Christmas, W. W. Aeroplanes. No. 9141. April 10th.

Craig, J. Carrying and releasing bombs, etc. No. 8755. April 7th.

Gammell, S. J. Assisting aircraft to land. No. 9173. April 10th.

Hargreaves, W. A. Silencers for aircraft engines. No. 9305. April 11th.

Hargreaves, W. A. Controlling-devices on aircraft, etc. No. 9306. April 11th.

Harwood, A. Aircraft planes, etc. No. 8948. April 9th.

McLaughlan, J. Level-indicators for aeroplanes, motor-cars, etc. No. 8978. April 9th.

Marschall, L. Automatic aeroplane director. No. 8791. April 7th.

Mellor, W. H. Parachutes. No. 9266. April 11th.

Paine, H. Scott-. Aeroplanes, seaplanes, etc. No. 9299. April 11th.

Paine, H. Scott-. Elevator-controlling mechanism in aircraft, etc. No. 9300. April 11th.

Paine, H. Scott-. Aircraft, etc. No. 9301. April 11th.

Paine, H. Scott-. Aircraft, etc. No. 9303. April 11th.

Paine, H. Scott-. Aircraft, etc. No. 9304. April 11th.

Paine, H. Scott-. Mounting of control sticks in aircraft, etc. No. 9302. April 11th.

Paine, H. Scott-. Bodies of flying-boats, etc. No. 9307 April 11th.

Rensch, B. Aeroplanes. No. 9120. April 10th.

Scheffermeyer, J. T. V. Means for synchronising compass and chart in flying-machines. No. 8749. April 7th.

Slinger, T. Helicopter flying-machine. No. 8678. April 7th.

Stewart, C. J. Apparatus for supplying oxygen, etc., for breathing in aircraft. No. 8810. April 8th.

Tidswell, H. R. Aerial propellers. No. 8711. April 7th.

Blacksher, E. M. Aeroplanes, etc. No. 9595. April 15th.

Boerner, A. System for feeding internal-combustion engines for airships. No. 9405. April 14th.

Bonson, E. W. Landing places for aircraft. No. 9569 April 15th.

Bonson, E. W. Landing devices for aircraft. No. 9570. April 15th.

Dixon, H. S. Flying machines. No. 9629. April 15th.

Lindemann, F. A. Gyroscopic turn-indicators for aircraft. No. 9521. April 14th.

Mallinson, B. H. Combined radiator and air-intake for aircraft. No. 9725. April 16th.

Normand, J. C. Folding framing for dismountable booths and hangars. No. 9867. April 17th.

Orman, F. R. Landing arrangements for aeroplanes. No. 9684. April 16th.

Parsons, J. G. Propulsion and steering of aerial and marine vessels. No. 9900. April 17th.

Piddock, J. Toy flying devices. No. 9885. April 17th

Richards, G. T. Aeroplanes. No. 9720. April 16th.

Sherrin, G. C. Speed-indicators for aeroplanes, etc No. 9515. April 14th.

Stamper, S. W. Aeroplanes. No. 9590. April 15th

Stephen, R. S. Marine, aerial, etc., compasses. No. 9790. April 17th.

Stevenson, W. J. Aeroplanes and airships. No. 9692. April 16th.

Complete Specifications Accepted, prints of which can be obtained on and after May 1st, 1919.

124,763. Jan. 3rd, 1916. Tesse, T. F. Coating-composition and process of applying same, intended more particularly for coating aeroplane cloths.

124,767. March 16th, 1916. Phillips, G. F. T. Apparatus for determining the altitude of aircraft.

124,783. March 27th, 1916. Aeronautical Instrument Co., and Brewer, G. Air-speed indicators.

124,785. March 27th, 1916. Mortimer, W., and Potten, F. Apparatus for facilitating the landing of aircraft.

124,787. March 28th, 1916. Coulson, W. T., and Optalyte, Ltd. Means for determining the heights from the ground of aircraft and the like.

124,790. March 29th, 1916. Peck, H. S. Aerial dart bombs.

124,808. April 13th, 1916. Sunbeam Motor Car Co., and Coatalen, L. Fuel-feed systems for use on aeroplanes and the like.

124,815. April 19th, 1916. Blackburn Aeroplane and Motor Co., and Blackburn R. Bracing between the planes of tri-planes and multi-planes.

124,819. April 20th, 1916. Day, B. I., and Rolls-Royce, Ltd. Construction of car framework of airships, aeroplanes, and the like.

124,822. April 25th, 1916. Beardmore and Co., W., and Richards, G. T. Controlling-devices for aeroplane flying-machines.

124,827. April 28th, 1916. Aeronautical Instrument Co., and Brewer, G. Combined pressure and static head for air speed indicators.

124,832. May 1st, 1916. Roe, A. V. Tilting mechanism for the tail planes of aerial craft.

124,834. May 2nd, 1916. Vickers, Ltd., Challenger, G. H., and Savage, H. A. Aircraft.

124,835. May 2nd, 1916. Vickers, Ltd., Challenger, G. H., and Savage, H. A. Aircraft.

124,844 Jan. 3rd, 1916. Tesse, T. F. Treatment of fabrics, and particularly the treatment of aeroplane fabrics.

124,848. June 6th, 1917. Davidson Aviation Co., Chester, W. E., and Morgan, L. Metal propeller bush for aircraft of all descriptions.

124,857. July 30th, 1918. Bygrave, L. C. Sights for use on aircraft.

124,861. March 1st, 1918. Lumsden, J. D., MacKenzie, R. W. R., Robinson, E. H., and Fort, M. Wings, and the like, of aeroplanes.

124,872. March 28th, 1918. Allen, R. Gun mountings for aeroplanes.

124,892. April 4th, 1918. Morch, J. J. Means for mounting propellers for aircraft.

124,893. April 4th, 1918. Tarrant, W. G., and Barling, W. H. Steering or controlling aircraft.

124,894. April 4th, 1918. Tarrant, W. G., and Bouillon, E. Means for operating the stabilising or steering devices for aeroplanes.

124,935. April 30th, 1918. Drzewiecki, S., and Rey, J. Self-setting sails or blades of windmills or of tractor screws or of pusher screws of aeroplanes or dirigibles.

124,939. May 8th, 1918. Watkins, H. E. Aeroplane level or position indicators.

125,003. Aug. 14th, 1918. Masterman, E. A. Mooring-devices for lighter-than-air-aircraft.

125,019. Oct. 16th, 1918. Fairey Aviation Co., and Fairey, C. R. Means of securing fittings to the spars of aircraft.

125,023. Oct. 17th, 1918. Blondeau, G. J. E. Fuel-supply devices for the engines of aircraft.

123,074. Feb. 1st, 1918. Stabilimenti Biak— Ing. A. Pouchain. Axle for aeroplane carriages.

123,748. Feb. 21st, 1918. Stabilimenti Biak—Ing. A. Pouchain. Axle for aeroplane carriages.

Complete Specifications Accepted, prints of which can be obtained on and after May 8th, 1919.

Brackenbury, E. W. Propulsion of air and watercraft and land vehicles. No. 10425. April 26th.

Calthrop, E. R. Parachutes. No. 10190. April 23rd.

Calthrop, E. R. Load-detaching devices for parachutes. No. 10191. April 23rd.

Caproni, G. Flying machine. No. 10340. April 25th.

Caproni, G. Landing-carriage for flying machines. No. 10341. April 25th.

Hall, W. Means for connecting to crankpin the connecting-rods of multi-cylinder radial or rotary engines. No. 10266. April 24th.

Hamilton, C. H. Level-indicators for aircraft, etc. No. 10084. April 22nd.

Malsallez, P. M. J., R.C.C.G. Landing-apparatus for aeroplanes. No. 10019. April 22nd.

Pastrone, G. Ensuring normal air conditions for persons in aircraft. No. 10256. April 24th.

Pavely, D. A. Compressed-air power plant for model aeroplanes. No. 9969. April 22nd.

Tarrant, W. G. Aeroplanes. No. 10070. April 22nd.

Westaway, J. Means for arresting or braking aeroplanes, etc. No. 10010. April 22nd.

Wiltshire, F. J. Gas-producer plants for vehicles, locomotives, aircraft, etc. No. 10002. April 22nd.

Complete Specifications Accepted, prints of which can be obtained on and after May 15th, 1919.

125,090. May 5th, 1916. Sperry, L. B. Means for controlling aeroplanes.

125,092. May 8th, 1916. Roe, A. V. Construction of aircraft wings.

125,093. May 8th, 1916. Cochrane, F. Production of fabrics having the property of invisibility.

125,096. May 11th, 1916. Henderson, J. B. Apparatus for indicating changes in the course of a ship, airship, aeroplane, or the like, also applicable for automatic steering.

125,106. May 19th. 1916. Fairey Aviation Co., and Fairey, C. R. Seaplanes, flying-boats, and the like.

125,109. May 19th, 1916. Nestler, F. C., and Nestler, Ltd., F. C. Portable sheds or hangars, and the like, portable structure.

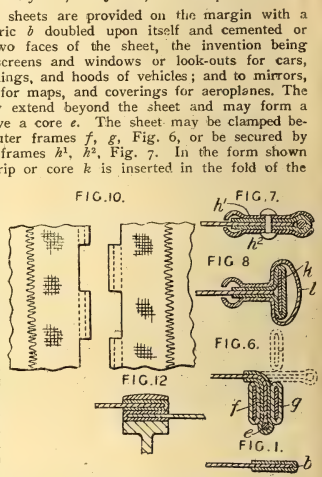
125,111. May 20th, 1916. Hall, L. M. M. Aeroplanes.

125,113. May 22nd, 1916. Ritchie, T. M., and Perrin, A. A. Airships, balloons, and the like.
125,114. May 24th, 1916. Vickers, Ltd., and Duncan, T. S. Mountings for guns carried by aeroplanes, and similar aircraft.
125,115. May 25th, 1916. Malder, A. F. Packing case, especially adapted for the transport of aircraft.
125,116. May 26th, 1916. Sunbeam Motor Car Co., and Coatalen, L. Cooling of internal-combustion engines such as are used on aeroplanes.
125,123. May 31st, 1916 Dunlop Rubber Company, Macbeth, C. Device for use in connection with aeroplane wheels
125,124. June 2nd, 1916. Edwards, W. N., and Gardner, J. D. Sighting-apparatus for use in dropping bombs or other missiles from aircraft.
125,125. June 2nd, 1916. Blackburn Aeroplane and Motor Co., and Blackburn, R. Aeroplanes.
125,126. June 2nd, 1916. Armstrong, Whitworth and Co., Sir W. G. Hadcock, A. G., and Forster, G. Non-recoiling guns suitable for use on aircraft.
125,152. June 19th, 1916. Peters, J. A. Aeroplanes.
125,159. June 21st, 1916. Saunders, S. E. Seaplanes.
125,161. June 23rd, 1916. Aeronautical Instrument Co., and Brewer, G. Balloons
125,162. June 23rd, 1916. Nalder, A. F. Portable hangar or shed for aeroplanes, and the like.
125,169. March 30th, 1916. Cazanave, A. Aeroplanes.
125,171. March 2nd, 1917. Cazanave, A. Aeroplanes.
125,196. April 3rd, 1918. Stead, F. Apparatus for shaping propellers for aircraft work.
125,209. April 8th, 1918. Rogers, R. H. Structural units in the form of beams, girders, and the like.
125,227, April 13th, 1918. Shirley, E. Clip or like attachment for wires or other stays on aeroplanes, etc.
125,249. May 1st, 1918. Gaynor, F. F. Station ships for an oceanic-aerial navigation and transport system.
125,261. May 11th, 1918. Morton, W. Means for attaching fabric panels to aircraft.
125,270. May 23rd, 1918. Boulton and Paul, and North, J. D. Means for loading the fuselages of aircraft with bombs or other articles.
116,893. June 12th, 1917. Kahl, J. F. Aeroplanes.
125,284. June 25th, 1918. Brown, E. E., and Mooney, D. J. Struts for aircraft.
125,317. Sept. 18th, 1918. Miller, H. W., and Bingley, F. Girders, spars, and like members of aircraft, and similar light structures.
121,464. Dec. 11th, 1917. Soc. des Moteurs Salmson. Tail-piece for aeroplanes.
125,398. June 28th, 1916. Flower, S. A. Airships.
125,419. July 8th, 1916. Roe, A. V. Detachable blade propellers for aircraft, and the like.
125,424. July 13th, 1916. Peters, J. A. Braking arrangements for aeroplanes.
125,429. July 18th, 1916. Sueter, M. F. Aircraft.
125,432. July 19th, 1916. Parkes, S. R. Bombs for use with aircraft.
125,438. July 25th, 1916. Power, R. F. Aerial observation.
125,440. July 26th, 1916. Hull, T. G., and Brewer, G. Apparatus for indicating the speed of ascent and descent of aircraft.
125,455. Aug. 5th, 1916. Barr and Stroud, Barr, A, and Stroud, W. Instruments for use in connection with anti-aircraft gunnery—an instrument for measuring the deflection and angle of sight correction with appliance for showing the fuse indication corresponding to the predicted position of target
125,456. Aug. 9th, 1916. Blackburn Aeroplane and Motor Co., and Blackburn, R. Manufacture of propellers for aeroplanes.
125,457. Aug. 10th, 1916. Phillips, G. F. Apparatus for calculating the ranges of aircraft from the observations of range-finders.
125,458. Aug. 10th, 1916. Blackburn Aeroplane and Motor Co., Blackburn, R., Copley, J., and Bumpus, F. A. Means or apparatus for adjusting or balancing the movement of the elevators or other controlling surfaces of aeroplanes.
125,460. Aug. 11th, 1916. Williams, E. T. Landing grounds for aircraft.
125,467. Aug. 17th, 1916. Pollen, A. H., and Chicken, C. B. Speed over land and drift indicator for use on aircraft.
125,468. Aug. 17th, 1916. Pollen, A. H., and Lanstad, H. F. Bomb-dropping sight for aircraft.
125,469. Aug. 18th, 1916. Saunders, S. E. Driving mechanism for the propellers of aircraft.
125,472. Aug. 19th, 1916. Vickers, Ltd., Challenger, G. H., and Savage, H. A. Means for firing guns carried by aircraft.
125,473. Aug. 21st, 1916. Hargreaves, F. J., and Blackburn Aeroplane and Motor Co. Controlling-mechanism for aerial machines.
125,474. Aug. 21st, 1916. Fairey Aviation Co., and Fairey, C. R. Aeroplanes and other flying machines.
125,479. Aug. 26th, 1916. Avery, W. and T., and Pratt, A. C. Aeroplanes.
125,504. April 16th, 1918. Baynes, C. Construction of controlling-devices applicable for use with internal combustion engines used on aircraft, and for other purposes.
125,530. May 30th, 1918. Ellis, J. Inclinometers for aircraft.
125,554. July 8th, 1918. Mooney, D. J. Treating steel for aircraft.
125,559. Oct. 2nd, 1918. Shaw, W. R. D. Aerofoils for aircraft.
125,564. Nov. 21st, 1918. Low, A. M. Apparatus for testing aeroplanes.

Abridgments of Recently Published Specifications.

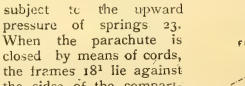
121,813. Celluloid panels; windows; aeroplane coverings. Dover, H. W., Holyrood, St. James, Northampton.

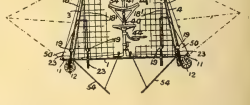
Celluloid and like sheets are provided on the margin with a strip of woven fabric *b* doubled upon itself and cemented or solutioned to the two faces of the sheet, the invention being applicable to wind-screens and windows or look-outs for cars, ships, aircraft, buildings, and hoods of vehicles; and to mirrors, scale-marked covers for maps, and coverings for aeroplanes. The doubled portion may extend beyond the sheet and may form a tube which may have a core *e*. The sheet may be clamped between inner and outer frames *f*, *g*, Fig. 6, or be secured by rivets between two frames h^1, h^2, Fig. 7. In the form shown in Fig. 8, a flat strip or core *k* is inserted in the fold of the fabric, and the frame is formed as a split metal tube *l*. The frame may comprise two wooden members secured together by screws which pass through the celluloid sheet. Fig. 10 shows a hinge joint for connecting two sheets edge to edge by means of a rod passed through the loops of the fabrics; the joint so formed may be covered on each side by a strip of wood, metal, etc. For covering an aeroplane wing, adjacent edges of the sheets overlap as shown in Fig. 12, and the fabric-covered margins are lapped over the nose of the wing to present a smooth leading edge.



122,164. Aeronautics. Leggelo, P. B. Van, 2405, West Sixth Street, Los Angeles, California, U.S.A.

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Propelling; steering.—The shaft 32 of the propeller 31 is universally jointed at 36, and may be moved in any direction by means of a hand-wheel 44 and a lever 40 moving over a sector 41. The motor may be suspended below the joint 36, as shown, or may be above it.

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Land wheels.—The floor 1 of the car is provided with extensions 11 at each corner carrying swivel wheels 12.

Tanks, arrangement of.—Fuel tanks are provided at 51.



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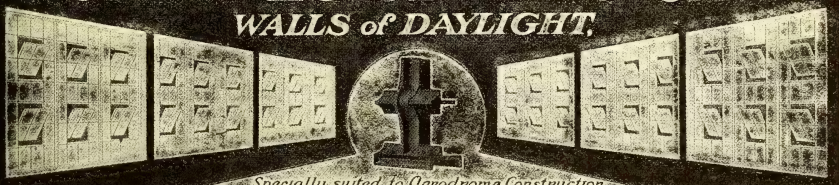
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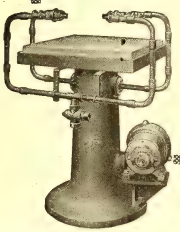
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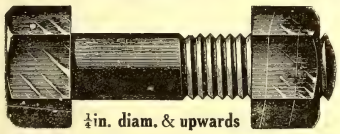
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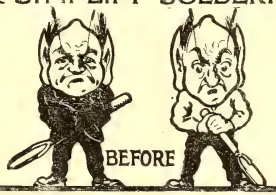
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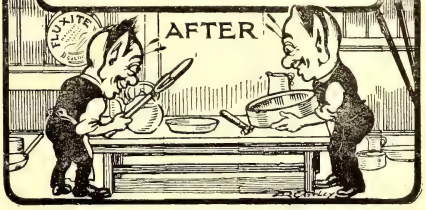


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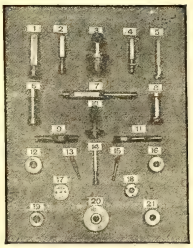
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I forget who first remarked, "Sweet are the uses of Advertisements." The phrase is one of which we are fairly often reminded. Thus I find in my morning paper two paragraphs on one page. The headings are respectively, "Flying Comedians" and "Flying Criminals."

The particular comedian referred to is Mr. Harry Tate, who contemplates making an aerial tour of the world in a Handley Page machine, carrying with him all the necessary company, scenery, and equipment for "Motoring" and other sketches, presumably including "Flying."

I do not for a moment suggest that there is any connection whatever between Mr. Harry Tate and the criminals already mentioned in passing. The juxtaposition of the two paragraphs merely gives one some idea of the extraordinary ubiquity of the aeroplane.

Mr. Tate's Dates.

First, as to Mr. Harry Tate's proposition. I have hinted at my impression that a recognition of the value of advertisement is not altogether unconnected with this paragraph. For some time to come long distance aeroplane tours are bound to be dependent upon weather conditions to a degree which will make it impossible to time exactly the arrival at each point. To me, in my ignorance, it seems a disadvantage to a theatrical company not to know until the last moment upon what date it will be able to give its entertainment.

Mr. Harry Tate is to make his first halt at Gibraltar. Will he book his theatre for a few weeks in advance, so as to be quite sure that it will be vacant when he arrives, or will he trust to luck to find him an adequate building capable of holding enough money to cover his expenses? These are professional problems on which I cannot profess to judge.

For the rest, the tour is to include Malta, Colombo, and various towns in India, China, Japan, and the United States. I presume that at the bigger centres Mr. Harry Tate will appear in the leading variety theatres as an extra special attraction, though it is rather difficult to understand how full advantage can be taken of his presence when advance bookings are practically impossible.



A FIVE-SEATER AVRO PASSENGER MACHINE.—The Photograph shows a standard Avro, type 504K, (100 h.p. Mono-soupape Gnôme Engine), transformed into a Five-seater Passenger Machine. The four passengers sit two by two behind the pilot. The Machine is in every way a standard Avro, except that the fuselage has been widened and strengthened to accommodate the passengers. With the standard Mono Gnôme the Machine lifts its five passengers easily, but the authorities appear to consider that for ordinary commercial purposes a higher power should be used, and, therefore, at present it is only being used to carry two passengers and a pilot. This type, with a 130 h.p. Clergêt or a 200 h.p. "Wasp" A.B.C. Engine should make an excellent passenger-carrier. Further interest is lent to the Photograph by the persons with the Machine. Reading from left to right they are:—Mr. R. J. Parrott (Works Manager of the Avro Hamble Works); Captain Hammersley (the firm's chief pilot, who is seen climbing out of the pilot's seat of the machine); the Hon. Mr. Smith; his father, Lord Birkenhead, the present Lord Chancellor, who was formerly Sir Fredk. E. Smith, K.C.; and Mr. H. W. T. Chilcott, M.P., late Lieut.-Commander, R.N.V.R., attd. R.N.A.S. Lord Birkenhead and his son had just returned from a flight with Captain Hammersley.

The Modesty of Criminals.

Let us, however, turn to the other side of our subject, namely, flying criminals. The particular mental warp that makes a man funny in public is different from that which dictates the actions of criminals of the common or garden type. The successful comedian differs from the successful burglar or forger inasmuch as the former possesses a highly developed bump of publicity that is altogether absent or admirably suppressed in the case of the latter.

With the exception, perhaps, of the politician, the well-known actor is the most efficiently advertised person in the world. From this standpoint his desires could not be further removed from those of the criminal. The fact that both are attracted to the possibilities of the aeroplane shows how extraordinarily ubiquitous the aeroplane is to become. Some men will fly to escape publicity, while others will fly to secure it.

Opportunities for Qualified Housebreakers.

The criminal of the near future has some wonderful opportunities. He need not confine his operations within a narrow radius, but can work rapidly over a very large area. The qualified housebreaker will, of course, be subject to a slight inconvenience if he wishes to extend his operations to foreign countries. In that case his stock of implements will be liable to examination by the Customs authorities, presuming always that it is found possible to make an aerial coastguard reasonably effective.

Obviously such a coastguard will be needed, and it remains to be seen whether the organisation for the prevention of smuggling will be identified with the aerial police, or whether the two will be kept separate. It would be rather characteristic of us to adopt the latter course, because it would afford a means of providing more official positions. It would, moreover, supply an extra annoyance to the average aeroplane owner, inasmuch as he would have to undergo two overhauls, one by the Customs and the other by the police.

The Respectable Felon.

Obviously, the right plan would be to classify smugglers with all other breakers of the law and deal with them all by means of one organisation. Then there will be no question about the allocation of responsibility in the event of the wrong man getting through unobserved. In any case, the detective's job will be difficult enough.

The class of offender most likely to make use of the aeroplane is the man who has posed throughout his life as a very desirable and trustworthy citizen. In all probability he is a sidesman with side whiskers, or a generous supporter of the local charities and a member of the local council. The fact that he has been diverting funds entrusted to his charge, imitating handwritings on cheques, or adjusting the accounts of companies of which he is an official, will not be known to the public until it is observed that he, in anticipation of a crisis, has disappeared from his customary walks of life. Meanwhile, this respected gentleman, having equipped himself with an aeroplane for which he has not paid, will have got somewhere near the far end of the earth, and all kinds of trouble will arise in connection with extradition, assuming that he is located at all.

Wealth Is Not Proof of Dishonesty.

It rather seems to me that the laws connected with extradition will have to be changed and the process made easier. One cannot arrest a man who is attempting to leave the country in an aeroplane merely on the grounds that he looks respectable and appears to be wealthy and therefore in all probability is dishonest.

From the man's point of view, the beauty of the aerial method is that it can put such a long distance between him and those who are looking out for him during the interval between the removal and the discovery of his defalcation. There will, no doubt, be some very pretty little incidents in which aeroplanes and red-handed criminals will figure, but the really awkward cases will be those of the men against whom there is nothing definite at the time of their flight.

POST-BELLUM POLICIES.

By The Special Commissioner of "The Aeroplane."

The Nieuport and General Aircraft Co.

"Nebuchadnezzar, King of the Jews,
Suffered from new and original views."

I am beginning to regard him as a very fortunate man. My own views are getting more and more stereotyped as I progress on this subject. But that is another story. On this question of Commercial Aviation it is only natural that many manufacturers agree on many points. As I have stated before, they are somewhat shy of allowing the publication of their more original opinions. The easiest way to write these notes would, no doubt, be to have a printed series of answers to certain questions, arrange according to answers received, and fill in the name at the top; but the Editor might object, in spite of the facts that it would make much quicker reading—and easier writing.

Reduction in Cost.

Major Heckstall-Smith is very decided on the necessity of a big reduction in cost in the manufacture of aeroplanes, and also insists that they should be very much more easy to repair in order to effect economy in upkeep, which would undoubtedly result. He is considering new and cheaper methods of construction with this end in view, without sacrificing strength be it undestood. He points out that the chief stumbling-block to economy at the present time is the exorbitant cost of engines. So seriously does he regard this that he is quite prepared to enter into competition with engine makers and start manufacturing his own engines, supposing always that the price does not decline very considerably. He says that at present the cost of a complete machine is made up as to one-third aeroplane and two-thirds engines, or thereabouts.

Types of Aeroplanes.

The Nieuport Company is going to confine itself to land machines, to consist for the present of a semi-large machine, as distinct from the Giant type prophesied, for passenger or freight-carrying, and two and three-seaters. Major Heckstall-Smith does not believe in the enormous machine, he thinks a span of about 100 feet to be quite large enough, and went on to say that for really heavy cargo work or carrying large numbers of passengers it will be the airship that will be used. He suggested that aeroplanes will be in use at the termini of long trans-continental airship routes to collect and distribute both passengers and goods.

The largest of the Nieuport family is to carry a cargo load of 2,000 lbs., have a ceiling of 12,000 feet, and a climb to 10,000 feet in about 20 minutes; these figures represent the probable limits of requirements in Major Heckstall-Smith's opinion. Light loading and slow landing speed will also be features.

Military and Commercial Aircraft.

He emphasised the necessity for keeping Commercial and Military types distinct, both as to machines and pilots. He considers the Military machine as useless from a Commercial aspect, and vice-versa, and that it is absurd to suppose that Commercial aeroplanes can be any safeguard to the country in case of war, any more than merchant-ships can be used as warships in that event. With regard to Commercial pilots, he says that they will, he thinks, become "bus-drivers" of the air, and that they cannot be regarded as a reserve from which to draw war pilots, especially as the very characteristics which make them safe and successful in their commercial occupation will operate against their success in war-flying. He regards bombing as the artillery of the future, and says constant pactice is necessary to ensure accuracy in carrying it out; thus the commercial pilot should not be military in any way.

Government Support.

Major Heckstall-Smith looks to the Government to assure the existence of certain firms, notably those whose war designs have been of proven value, by placing orders for war machines, at any rate to tide over bad times, he says it would be a disaster if our best designers were attracted by offers from abroad. This applies to both Military and Commercial designers, and he further states it would be a menace to our national safety. He regards 100 miles per hour as the economic speed, and the comfort of passen-

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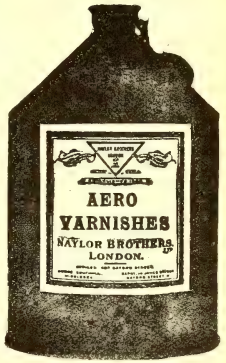
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gers as important. In his own words, "One has to turn from bombs to plush-covered seats." It may have been imagination, but I thought he did not look altogether pleased at the prospect.

The two and three-seaters will be purely joy-riding machines on scout lines, presumably on those of the Night Hawk, the price is to be in the neighbourhood of £500.

He regards the life-of-the-machine question entirely from the commercial point of view, and not as to how long the machine will last. How much can be reasonably written off for depreciation in making up a balance-sheet for the year's working? If he were a director of an Aerial Transport Company he would be inclined to go to the extent of writing off 100 per cent. of a machine after its first year. In other words, he places the commercial life at one year, of course it might be longer, if so, so much the better, but that is his view of the financial side of it. He thinks it is a safe and apparently conservative basis on which to make out charges against capital account.

COMPETITIONS.

I gather that in the way of competition machines the firm will confine itself to building high-speed Military scouts, and though this implies that they will not build for commercial competitions, it may not necessarily be so, for when the conditions for such are published, it is quite possible that different plans will be made. After all, it is rather one of the problems of the future, this competition question, which may resolve itself into tests between a few manufacturers who agree amongst themselves to build to certain specifications. It is not to be supposed that after the almost daily spectacle of flying during the war the public will easily be coaxed into parting with its shillings to see much the same thing during peace.

Also, there is a limit to the amount of advertisement to be got by offering large money prizes.

Taking it all round, it appears that the policy of the Nieuport Company is to be chiefly concerned with Military rather than Commercial Aeronautics; at any rate, it is apparently from war machines that the company is expecting to make its profits in the future. In this connection it must be remembered that the production of the Night Hawk may possibly have made its influence felt. I wonder if it is altogether good from the commercial point of view for a firm to turn out a highly successful war machine, I am inclined to think it is apt to overshadow commerce.

STUNTS OR BUSINESS.

My remarks on the value of the Atlantic flights at the present juncture from the commercial standpoint appear to have had an extremely irritating effect upon "Capt., R.A.F.," whose letter was published in THE AEROPLANE of April 9th. If he has not exactly got hold of the wrong end of the stick he has certainly not got a very firm grip of the right end.

In the first place, I would remind him and any other readers who are out of sympathy with my views that my business is confined strictly to the consideration of the commercial aspect of the case. This is not the section of the paper in which to discuss the purely sporting aspect.

I have the very greatest respect for the men who have risked their lives day after day in aerial warfare. My respect for any and all of these men goes so far that it could in no way be increased by their success in a venture perhaps no less risky but of a totally different class. The R.A.F. has lost thousands of good men during the war. I am loth to see the lives of those who have survived jeopardised for what I consider to be a comparatively inadequate cause.

If the trans-Atlantic flight presented no risks then I maintain that the public interest in it would be vastly less. This interest is in fact based largely on the desire for sensation, as I have already pointed out to the disgust of "Capt., R.A.F."

My critic wastes a lot of valuable ink in classifying me with people who in their day ridiculed the possibilities of railway trains and steamships. May I remind him that one of my first statements was "We know perfectly well that it is possible for an aeroplane to fly the distance."

I admitted that the first man to do it would attain at least a transitory fame and considerable financial reward. As a speculative investment the thing, therefore, appeals to a certain number of people. Later on we shall have regular trans-Atlantic services, but whether these will first be conducted by aeroplane or by airship remains to be seen.

For the moment, from the commercial standpoint, which is the point of view that it is my business to consider, the thing is not worth doing because it cannot add appreciably to our useful knowledge of how practical services should be run, and there are at least grave risks that it may have the effect of over-accentuating those drawbacks of aerial services that still have to be encountered and overcome.

On the day on which I am writing this note—April 14th—I find in my morning paper intimations to the effect that various famous aviators have been obliged by weather conditions to postpone making a start. Every announcement to this effect rubs into the mind of the public the fact that aerial travel is still dependent on weather.

I also find a note to the effect that in one case, at least, the under-carriage of the aeroplane is to be dropped shortly after the start, which necessitates a crash on landing. This is an admission that the flight is an adventure and not a demonstration of commercial possibilities.

I sincerely hope that before these lines appear in print we shall not have read that valuable lives have been lost and that evidence is being piled up to make the average member of the public feel more than ever that aerial travel is a very risky business.

In my opinion, at the moment the wise course would be to play for safety; not to attempt too much all at once but to go about the whole proposition gradually and carefully. I do not want anything to happen which will put back the clock by over accentuating the elements of danger and of an inability to work to time table.

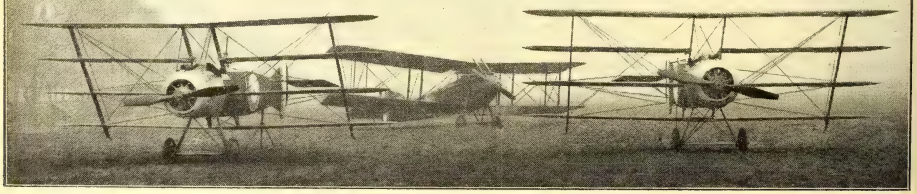
I should like to see commercial aeronautics developed as promptly as possible, largely because that development will provide congenial and valuable employment for many of the men who have done such splendid service in the R.A.F. Every failure means, to my mind, the postponement of a number of openings for these men.

In short, I am not over happy about the whole thing. "Capt., R.A.F." may jeer at me on account of my fears and may despise my commercial spirit. It is, however, out of commerce that the majority of us have to make our livings.

The time will, of course, come when trans-Atlantic aerial services will be absolutely safe and absolutely punctual. I do not contest this for a moment. Where I really differ with "Capt., R.A.F." is that I, personally, consider the present moment inopportune for the first great event in this new field.

I feel that the effects of failure, should it occur, would be so serious as to out-balance a hundred times the effect of the success which is inevitable at a very early date, and because of its inevitability, has already been largely discounted. The man who makes the record will, of course, be a public hero. He will loom much bigger in the eyes of the public than men who have done many equally heroic things in the air during the past four years. He will have demonstrated an almost superhuman endurance of nerve-strain.

I do not think our aviators need to provide any further proof of their qualities of skill and courage and their adventurous temperament. There is a heap of sound work to be done in developing real solid commercial aeronautical propositions and in the interests of those whose living depends upon the development, I grudge time spent on what seems to me a more showy, more dangerous, but no more important, adventure than a score of others which need to be undertaken in the near future.—"MEDWAY."



THREE EXPERIMENTAL ACK-Ws.—Two of the F.K.10 Type Quadruplanes and an F.K.8 with a Sunbeam-Coatalen "Arab" Engine.



An impression of the night flight by Mr. Grahame-White at the Hendon Aerodrome, the lighting being by Messrs. Rushmores, Ltd.

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CIVIL AVIATION.

With possibly one exception, that of the flight of Mr. H. J. Thomas, of the British and Colonial Aeroplane Co., Ltd., from Filton to London, little was done on May 12 to mark the inauguration of civilian flying.

Naturally the weather was responsible, for, although a Service pilot must fly in bad weather at times, it is, to say the least of it, unnecessary for civilians to do the same. So May 1st, hailed by all the newspapers as the day which was to set flying free, passed and left things much as they were.

Flying in Unfavourable Weather.

On May 1st Mr. H. J. Thomas, Director and Works Manager for the British and Colonial Aeroplane Co., Ltd., had an important appointment in London with Major.-Gen. Seely, and decided to take immediate advantage of the removal of the restrictions on civilian flying. From the various types of "Bristol" machines suitable for commercial flying, Mr. H. J. Thomas chose a "Bristol" "Coupé" as being the most convenient for his purpose. This is an extremely fast machine, designed to carry a single (why not married?) passenger in a warm, closed-in coupé, fitted with a writing-desk and in telephonic communication with the pilot. The engine was of the Rolls-Royce "Falcon" type.

In spite of the fact that the wind was blowing almost a gale, that rain was falling in heavy showers, and that mist and low-lying clouds made the conditions most unfavourable, Mr. Thomas started on his journey piloted by Lieut. Ewins. With the strong wind behind them remarkable speed was made: Swindon was reached in 12½ minutes. After passing over Didcot the aeroplane encountered a particularly heavy storm of rain and wind, and a deflection was made to avoid the storm centre. This necessitated a wide detour *via* Aylesbury, so that Hounslow was approached eventually from the north. An excellent landing was made in the aerodrome 58 minutes and 5 seconds from the time of taking off at Filton. Aylesbury to Hounslow took 10 mins.

The landing was made shortly before 11.30, so that Mr. Thomas won for himself the distinction of being the first civilian passenger to land at an officially appointed aerodrome under the British Air Ministry, either in London, or so far as can be ascertained, at any point within the British Isles.

So far as can be ascertained, the only important descents which were made on the national aerodromes on the appointed day for civilian flying were confined to London and Manchester. It is interesting to record that just as a "Bristol" machine was the first model to land within the Metropolis, so in Manchester the first aeroplane to land was a "Bristol" Fighter piloted by Capt. West, which conveyed aeroplane films from Reading.

Newspapers by Air.

Two daily newspapers had arranged to have their papers carried by air, but neither of the machines reached its destination. The "Daily Express" representative was to fly to Manchester, but only reached Rugby, and the "Daily Mail" representative was to fly to Bournemouth, but crashed on Portsdown Hill, Portsmouth. Capt. Saint, one of the two occupants, sustained a fractured jaw, and Capt. Grieg was badly shaken.

On May 3rd Mr. Sidney Pickles on a Fairey seaplane (Rolls-Royce engine) flew from the Thames opposite the Houses of Parliament to Westgate and Margate with copies of the "Evening News," and also made the return journey to Blackfriars Bridge, where the seaplane was hoisted onto a barge.

Major E. L. Foot, R.A.F., flying a Handley Page, made a tour of Brighton, Eastbourne, and Hastings from Hounslow, dropping copies of the "Evening News" by Guardian Angel parachutes at each town. The aeroplane left Hounslow at 4.50 and returned at 10 p.m.

The "Daily Mail" two-engined Handley Page aeroplane (Rolls-Royce engines) made a fine non-stop flight of 370 miles on May 5th with newspapers and ten passengers. It left Manchester at 5.20 and passed over Carlisle, Dundee, Aberdeen, Montrose, and Edinburgh. At Aberdeen Major Orde Lees descended by parachute in order, he said, to pay a visit to an old friend. The machine carried 1,500 lbs. of newspapers, which were dropped along the route by parachute.

London to Manchester.

On May 1st a Handley Page machine (two Rolls-Royce engines) left Cricklewood Aerodrome, carrying ten passengers and 6 cwt. of luggage, for Manchester. The pilot was Lieut.-Colonel W. S. Douglas, R.A.F. The flight was a non-stop one. In spite of a very strong head-wind of about 30 miles, the machine arrived safely in Manchester in about four hours.

Another flight on the new civilian air route from London to Manchester ended on May 1st, in a disappointment; but when or how exactly it ended it is not yet possible to say. Great interest was taken all day at the Alexandra Park Aerodrome, in the expected arrival of two aeroplanes which should have started from London as early as six in the morning—one carrying Madame Venn, with some of her well-known merchandise for sale in Manchester, and the other a Press correspondent.

But to the great disappointment of quite a lot of the general public, as well as the W.R.A.F.s, nothing more satisfying arrived in daylight than a telegram to say that Madame Venn had passed Coventry (?) The weather, of course, was abominable. Late this evening news arrived from Madame Venn to say she was safe at Long Buckley.

A Long Run.

Another good flight was made on May 3rd by another Handley Page machine (four 350 h.p. Rolls-Royce engines) which flew from Belfast to Carlisle, Newcastle, York, Doncaster, Lincoln, Boston, and across the Wash to Bircham Newton, a total distance of 410 miles, in four hours and 20 minutes. The weather was very bad and at one point the machine ran into a hailstorm.

CIVIL AVIATION IN SCOTLAND

By a Scottish Correspondent.

The principal Scottish civilian flying station, Turnhouse, was affected in no way by the inauguration of pleasure and commercial flying on May 1st. I paid the Edinburgh aerodrome a visit in the morning expecting to see some signs which would indicate a busy time in the world of aviation, but had to return disappointed, and rather surprised at the pessimistic attitude which some of the aerial officials adopted.

Nor did they take any pains to hide their views. They seemed, indeed, to take delight in prophesying the failure of post-war commercial aviation, unless it were connected with military or naval schemes. There were, however, no signs of a civil or commercial invasion of the Turnhouse station. On the historic date there was a belief in the Scottish capital that possibly one or two machines would land at this ground, but unless for highly experienced pilots any attempt at flying on May 1st was certain to meet with failure. The Clerk of the Weather was evidently against any flying in Edinburgh and district on the first civilian aviation day. There was a very high wind blowing across the station, and later in the morning heavy clouds gathered and rain was accompanied by gusts of wind.

The Lack of Clear Regulations.

The general opinion at Turnhouse is that the officials will not be troubled very much at any time by visiting machines. The officers who are to deal with the arrival of private machines are as yet almost in ignorance of their duties. At the time of writing no clear regulations have been issued by the authorities beyond the usual official statements regarding procedure in the air and so forth, and the officials are in a quandary. Of course, according to the regulations, any machine landing at Turnhouse or any other stations must be in possession of a registration number. This number would be checked at the Edinburgh station if the machine landed there, and the pilot would need to produce his "bona-fides" in the shape of his certificate and registration number.

The supplying of petrol, oil, and other necessities and the carrying out of repairs would be done by expert mechanics, a charge being made for the amount of work done. In expectation of machines arriving, two large hangars have been cleared, and the ground will now be taken over by the civilian flying authorities.

Farewell Stunts.

The military pilots with their machines are removing. In fact, some left the ground and raced across the stormy sky during the time I was at the station. The farewell took the form of several daring stunts, magnificently carried out on Sopwith Camels.

There is, as yet, no talk of a mail service from the South to Edinburgh or from the city to the West or North; but it was explained that in the event of such a venture on the part of the postal officials the work would devolve on the Turnhouse officials. The public will, of course, be able to obtain pleasure flights at this station, and it is expected that some excellent business will be done.

Scottish Gloom.

There is a belief that the British Caudron Company will take over a part of the aerodrome for pleasure flying, and it might be pointed out that this venture would meet with the greatest approval from the citizens of Edinburgh.

As already indicated, officials at Turnhouse are not in the least attracted by the new civilian flying regulations, and, indeed, foretell failure for any schemes. One officer stated to me that the "game was not worth the money." He quoted the case of an individual who might for business reasons require to undertake a journey of 4,000 miles. Taking into account the expenses of the trip, it would work out at about £2,000 as the sum which the passenger would need to pay as his fare.—McP.

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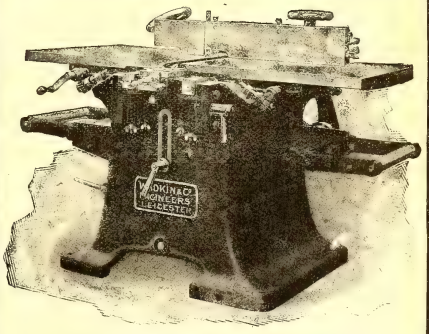
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AIRCRAFT FINANCE

THE AERODROME CONSTRUCTION CONTRACTS.

The Appropriation Accounts presented by the Air Board (and Air Ministry), covering the first year of its separate existence, raises one's hopes of great revelations—and almost immediately there is a slump below zero. Neither are they illuminating nor comprehensive, but, on the contrary, rather more dull than ditch-water.

The Year's Appropriations.

In reality they are not accounts, as one commonly understands a balance-sheet, but simply a bald statement of sums appropriated by permission of Parliament "for the purpose of organising and maintaining the supply of aircraft in the national interest in connection with the present war," and refer only to aerodrome accommodation provided and contemplated.

Treasury Criticism.

But even the policy relating to the provision of aerodromes can be made to serve up some interest. Thus the Treasury, which is commonly supposed to keep an eye on extravagance, considered it necessary to correspond with the Air Ministry apropos the method or principle of contracting.

The New and the Old Style.

As an example of Treasury criticism, the Air Ministry revised the form of contract which did not appeal to the Treasury as being so advantageous or economical. This gingered up both parties. Lump-sum contracts being impracticable, they were placed on a commission basis. The War Department contract superseded by the new method of the Air Ministry was :—

(1) Contractor's commission calculated at, in most cases, 3½ per cent. and 4 per cent. on the contractor's cost.

(2) No commission payable on any material supplied by the War Department.

(3) Depreciation and hire of plant were to be valued and paid for accordingly.

The Air Ministry substituted the following terms :—

(1) Contractor's commission calculated at 4 per cent. on the first £250,000, 3 per cent. on the next £250,000, and 2½ per cent. on all above £500,000.

Reservations.

To the casual observer the new seems the cheaper way of contracting, especially as the work was on a large scale as a rule. Moreover, the terms provided a time limit within which the contractor *undertakes to do his utmost to complete the work* and reserve power to the Air Ministry to *cancel the contract if they considered the rate of progress insufficient*. Such reservations were important, provided they were exercised efficiently.

The Toothsome Titbits.

There are some toothsome titbits in the Treasury comment on this definition of policy. It was regretted that the Administrator of Works and Buildings should have taken the step (which was clearly outside his competence as an officer of the Ministry of Munitions) of cancelling and revising in a sense *more favourable to contractors the already liberal contract terms* on which aerodromes were being constructed for the War Office.

As these contractors were receiving a percentage on their expenditure and incurred no risk, it is difficult to understand, said their Lordships, what public benefit could be derived from a change which increased their remuneration (by an amount which they note is estimated at £66,000) without, so far as can be seen, securing in any particular an additional advantage to the State. This £66,000, by the way, was a conjectural increase brought about under the new contracting.

Some Sauce Piquante.

Continuing, their Lordships of the Treasury serve up to the Air Ministry some *sauce piquante* in the following brief, bright, and brotherly manner; they note that the ground alleged (for revising the contracting method) is that the contractors were *not making sufficiently handsome profits*, and had, therefore, "lost interest" in their contracts, but the Army Council say that this statement is entirely at variance with the information at their disposal.

Complaints of Wasted Money.

The complaints which their Lordships have received from many quarters, continues the Epistle of the Treasury, as to the waste of money which is arising in connection with aerodrome contracts reinforce their view that the form of contracts on the cost plus percentage system is open to serious objection. The Air Ministry's contention of the impracticability of lump-sum or similar contracting failed to carry conviction. From the point of view of urgency and efficiency, runs the concluding paragraph, it is difficult to see how anything but harm could result from a contract under which a contractor had *no incentive to press on the completion of the work, but has, on the contrary, a direct incentive to allow his workmen to idle and accumulate unnecessary expense*.

Compassion.

This is a palpable hit, and, so far as an outsider is able to judge, the lead is with the Treasury. But it is easy to criticise, as the French philosopher remarked. Constructive criticism is useful, and produces healthy results sometimes. One is not sure whether to be compassionate with the Air Ministry and make a liberal concession for the natural faults of youth or smile grimly.

The Amount Spent.

As from April 1st, 1918, the Air Council assumed much more complete financial responsibility for services connected with the R.A.F., including pay, stores, and transport, but the supply of technical air equipment remained with the Ministry of Munitions. The expenditure for the year was £2,531,974, made up as follows :—

Salaries, wages, etc.	£107,518
Travelling expenses	4,255
Incidental expenses	10,312
Miscellaneous stores	1,058
Works and buildings	2,408,831

Uncompleted Schemes.

On the cessation of the Armistice, measures were taken to stop work on the construction of aerodromes, and by the end of March work had ceased at 71 sites without completion of the original plans.

CURRENT TOPICS.

A Professorship of Aviation.

Apropos the gift by the Board of £25,000 for the foundation of a Professorship of Aviation in London, agreement was not reached between the University and the Department, on the conditions attaching to the foundation, until July, 1918, when the Air Council decided that the capital endowment should be paid over with interest, and the Auditor-General, in assenting to

the charge of interest at 5 per cent. against the funds of the Ministry, points out that the Treasury regretted that the matter had not been referred to them earlier, as immediate investment in Government securities would have been advised.

CLERICAL STAFF GROWS.

The civilian clerical, etc., staff at headquarters on January 31st, 1919, numbered 2,768, against 667 on January 11th, 1918, and 1,692 on April 26th, 1918. As against the continued increase in numbers of male staff after the date of the Armistice it appears that the military staff has been appreciably reduced.

W. J. DAVIES.

ON MATTERS ACTUAER AL.

BY CAPTAIN P. A. BARRON (LATE R.A.F.).

The subject of Aviation Insurance has been discussed at length by writers and lecturers, "too tedious to mention," to use the words of a certain truthful but tactless reporter.

These discussions have a tendency to wander into what one presumes are purely academic investigations into the effects of alcohol upon the lateral stability of pilots, and the necessity of registering officially the characteristics, congenital or acquired, of those who fly.

GRAVITY NOT TO BE TREATED WITH LEVITY.

Thought seems to have run in the direction of life or accident insurance of those persons who though they aspire to the stars remember that the force of gravity is not to be treated with levity. But this is only one aspect of the problem. The other is the insurance of aircraft, and this is quite as important.

Until all types of aircraft can be insured at reasonable premiums it is difficult to see how one can expect great advances in the utilitarian application of aeroplanes and airships.

One heard recently of a clause in a policy to the effect that claims would be settled less 1/500th for each hour of flying life of the aircraft after its first 100 hours. This clause calls for some consideration.

It is evident that after a machine has flown for 100 hours its life as an "A.1. at Lloyds" craft is considered to be at an end. After 200 flying hours its value is supposed to have dropped to 4/5ths of the amount for which it was originally insured, and after 600 hours its value is to be considered nil.

A VERY UNPROFITABLE CRASH.

This means, one presumes, that if an insured machine crashed after the completion of 600 flying hours the owner would be entitled to nothing whatever. To put the proposition in another way, if the machine were to fly two hours each day (excluding Sundays) its value would be regarded as nil at the end of a year.

Now, as machines and engines are at the present time, it would be quite impossible to keep an aeroplane in commission for one year without renewing a great many parts. In the case of the engine a large number of the wearing parts such as valves and valve operating gear, bushes, pistons and rings would have been replaced many times over before the year had expired. The aeroplane would in all probability consist of only a small proportion of its original parts and the remainder would be new.

If it had received proper attention throughout the year it should be as airworthy at the end of the twelve months as it was at the beginning.

The system, therefore, of depreciating its value solely in accordance with the number of hours flown strikes one as absurd.

NOTHING LEFT OF THE MACHINE EXCEPT THE NUMBER.

One may with advantage consider the methods employed in the R.A.F. A machine was taken over from the manufacturers and allotted a certain number. In course of time it might be fitted with a new engine, new planes, a complete undercarriage, and possibly the fuselage might be entirely re-built. Thus practically nothing of the original machine would be left except the number, and that might be painted on a new rudder.

But it would be absurd to say that the machine was less airworthy at the end of its service. It was equally safe, and, providing that the replacements had been made efficiently, it should have had an equal insurable value throughout its life.

Now when we consider the problem of aircraft insurance one fails to see why one should assume that commercial firms will not apply the same methods, in this respect, as those of the R.A.F. One presumes that they will not be allowed to fly machines that are not airworthy, as one has been assured that aircraft will be inspected daily by licensed ground engineers.

THE THING THAT MATTERS.

Therefore it would appear that the number of hours flown is not the chief factor to be taken into consideration in determining insurance premiums. The thing that matters is the airworthiness of the machine, and that is to be certified officially from day to day.

In its comparatively short life an aeroplane does not deteriorate as do ships, for example. Owing to the rapid development of the science of aeronautics they become obsolete very rapidly, but during their period of utility they must always be tuned up to concert pitch. Were it not that they have been superseded by improved types some of the machines built five years ago might be just as airworthy, or air-unworthy, as they were when they first left the ground, though it is probable that there would be nothing left of the original engine or aeroplane.

NOT LIKE BRET HARTE'S MINER.

Bret Harte in one of his stories referred to a certain miner who regarded clothes as a second skin only to be sloughed off through decay. Do insurance companies think that aeroplanes will be worn out in the same manner until the fabric has sloughed off the planes? One can assure them that they will not.

One might perhaps argue on the law of averages that the longer an individual machine flies the greater are its chances of meeting with an accident, but one's reason tells one that in the case of aircraft this is not necessarily so.

A FEW WHOLE-HEARTED CRASHES.

If one thousand machines flew two hundred hours each it is probable that some of them would crash so whole-heartedly that they would be write-offs, but one is not compelled to believe that there would be more crashes among those in their 'teens than among the centenhourians.

Certainly as time goes on aircraft will be produced that are less liable to damage than those we have to-day, and guided by future experience (plus the compelling force of competition), insurance companies will quote lower premiums for the newer and safer craft. Also, guided by experience, they may decline to renew policies on older types of machines on the terms first quoted.

SOME ENTIRELY NEW PROBLEMS.

The particular point one wishes to drive home is that in the insurance of aircraft one cannot be guided entirely by analogies. Aeronautical actuaries (may one call them Actuaerial experts?) have entirely new problems to solve. They should realise that the number of hours during which a machine has flown is not the chief factor that should determine the premium. Airworthiness is the premier consideration.

In the Air Navigation Acts, 1911-1919, Directions issued by the Secretary of State for Air under para. 3 (2) of the Air Navigation Regulations, 1919, dated April 30th, 1919, one finds the following:—

"8. Aircraft certified daily by such Licensed Ground Engineers will be periodically re-inspected by a person or persons duly authorised by the Secretary of State, who reserves the right to suspend or revoke licences granted as above, should such certified aircraft be deemed by him as a result of such examination to be unsafe.

"9. Ground Engineers certifying flying machines or engines as airworthy after overhaul, must be in a position to certify that all the conditions required for the inspection of subsequent aircraft during construction that apply to the overhaul have been carried out. The Secretary of State reserves the right to suspend or revoke the licence of the Ground Engineer responsible for certifying that the overhaul has been correctly carried out, should a test inspection be deemed by the former to indicate that the flying machine is not airworthy."

A SUGGESTION.

One would, therefore, suggest that in the present darkness of our inexperience insurance policies should be issued for short periods, for example, three months, and should be renewable for similar periods at perhaps a slightly higher premium, so long as it can be shown that the official inspections prove the machines to be airworthy, and that replacement have been made as required.

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AIRCRAFT IN PARLIAMENT

The following oral answers were given on April 30th:—

PARIS-BORDEAUX POSTAL AEROPLANE.

Mr. JOYNSON-HICKS asked the Under Secretary of State to the Air Ministry whether his attention has been called to the burning of the Paris-Bordeaux postal aeroplane on the 7th instant; and whether he will cause experiments to be made with a view to the utilisation of more steel and less inflammable materials in the construction of civilian aircraft?

Mr. PRATT (Lord of the Treasury): I am not aware of the actual cause of the accident referred to, but in the great majority of such cases fire is caused primarily by petrol. The substitution of metal for framework and fabric would reduce only slightly the risk of fire or the probability of injury to personnel. Experiments on the lines suggested are actually being made, but till further knowledge is obtained—and this will take some time—I do not anticipate that it will be practicable to employ metal extensively in aircraft construction. The risk of fire from petrol is being reduced in English aeroplanes by various improvements which are being introduced.

CIVIL AVIATION DEPARTMENT.

Mr. JOYNSON-HICKS asked the Under Secretary of State to the Air Ministry whether he can now make a statement as to the staff and work of the Civil Aviation Department?

Mr. PRATT: The provisional staff for the Department of Civil Aviation has been put forward by the Controller-General, and his proposals are now being considered by the Reorganisation Committee preparatory to obtaining Treasury sanction for the organisation as a whole.

Meantime provisional Treasury sanction has been obtained for some of the higher posts in the Department, and the Controller-General is carrying on with a nucleus staff lent by the Royal Air Force and composed of officers who have during the war gained the necessary experience in the various directions required.

The work which the Department of Civil Aviation will at present undertake may be broadly divided into four heads, of which I am circulating a full description with the Official Report, as it is too long for oral answer.

The following is the description referred to in the last paragraph of the foregoing answer:—

(i.) For general consideration, co-ordination, and planning, including that of air routes both at home and abroad. For examining and advising on the broad aspects of schemes for commercial aviation. The branch will have two main sub-divisions: one to deal with questions concerning the United Kingdom and the other with similar matters arising overseas.

(ii.) To obtain, co-ordinate, and issue technical and non-technical information of value to the industry and the other branches of the Department through the Controller-General to supply information to the Royal Air Force and all other services concerned. In this branch three sub-divisions are being formed: one to deal with non-technical information, the second with technical subjects, and the third to co-ordinate and issue information of every kind and to deal with publicity generally.

(iii.) The third branch will be known as the "Communications" Branch, and its duties will consist in giving technical advice and assistance to aerial navigation in regard to navigation questions and all forms of signals and communications, including wireless, directional and otherwise, visual signals and land lines. This branch will also be responsible for work in connection with aerial surveys and for the preparation and issue of special maps and charts necessary for aerial navigation. It will have two main sub-divisions, one to deal with signals in a broad sense, and the other with navigation, charts, maps, and surveys.

(iv.) The fourth branch will deal with questions relating to the inspection and organisation of all aerodromes used for civil purposes, and with the licensing and registration of aerodromes, aircraft, pilots, and technical personnel employed in civil aviation. It will also carry out the investigation of accidents and their causes and the compilation of technical reports and records relating to this subject. This branch will have three main divisions. The first will deal with the inspection and organisation of aerodromes, and airship and seaplane stations; the second with the licensing and registration of aerodromes, aircraft, and personnel; and the third with accidents.

In addition to the four branches it is proposed that there should be a Meteorological Section directly under the Controller-General. This section would deal with the location and supervision of the meteorological centres and stations, the issue of forecasts, warnings, and upper-air information, and generally with the meteorology of air routes. It would also carry out special investigations into climatic conditions generally, taking care to co-ordinate its operations with any other services concerned. At present the general question of the organisation of the meteorological services is under consideration by the Cabinet, but pending a decision the Controller-General has taken over the meteorological branch which served the Royal Air Force during the War, and the personnel of this branch are being lent provisionally to his Department, which supplies all information required by the Royal Air Force.

* * *

The following oral answer was given on May 1st:—

MISSING AIRMAN (LIEUTENANT MARS).

Mr. ROTTOMLEY (by private notice) asked the Minister for Air whether he has any further information as to the fate of the missing airman, Lieut. Mars?

The UNDER SECRETARY OF STATE FOR AIR (Major-General Seely): Yes. Lieut. Mars, one of the officers of the Communications Squadron, left Nivelles, near Brussels, on June 22nd, bound for Kenley. He was observed by an officer in another aeroplane crossing the Channel, but as he failed to arrive inquiries were made at all the aerodromes to which it was thought he might be gone, and the Channel was searched and no trace of him was found. What happened was that he turned back in mid-Channel, apparently owing to engine trouble, and endeavoured to reach Nivelles, but was forced to land in a remote country district. I assume that he notified what had happened to those in the district where he landed, but through some mistake the notification was not passed on. Full inquiry is being made on this point. I am glad to say that this officer is alive and well.

* * *

The following written answers were given on May 1st:—

ROYAL AIR FORCE.—MOTOR-CARS.

Mr. PRESTON asked the Under Secretary of State for the Air Ministry whether large numbers of motor cars are still being purchased each week by the Royal Air Force; whether it is necessary for the Royal Air Force to have so many additional motor cars; and, if so, whether he can arrange that motor cars for which the Army have no longer any use can be transferred to the Royal Air Force, and thus save the expense of purchasing new cars?

Major-Gen. SEELY: All contracts for M.T. were cancelled after the Armistice, and no new vehicles have been delivered to the Royal Air Force since the middle of January last. The remaining parts of the question, therefore, do not arise.

DISMANTLING AEROPLANES, FARNBOROUGH.

Lieut.-Col. Sir S. HOARE asked the Under Secretary of State to the Air Ministry whether German prisoners have been, or are now, employed in dismantling and scrapping aeroplanes at Cove Camp, Farnborough; whether many of these 'planes are new 'planes, if so, why they are being dismantled; and whether some of the 'planes so dealt with are still in their factory wrappings, and some which have been used could easily be repaired?

Major-Gen. SEELY: The answer to the first part of the question is in the affirmative. A certain number of new machines have been reduced to produce at Farnborough. They are all of types which are obsolete for present purposes and for which there was no prospect of profitable disposal. No standard machines which it would have been economical to repair have been thus dealt with. I have satisfied myself, after careful inquiry, that the cost to the State of dealing with these machines in this way is less than that of housing and maintaining them with a view to sale.

AEROPLANE CONSTRUCTION (CYPRESS).

Mr. REMER asked the Secretary of State for War whether he has had inquiries made into the circumstances how cypress came to be sanctioned for use on aeroplanes contrary to all the expert advice given by timber opinion; how many pilots' lives were lost through this unsuitable timber being used; what was the cost to the nation of this colossal blunder, and whether, in order to avoid such occurrences in future, he will appoint a trade committee to fully investigate and advise on the proper woods to be used in aeroplane construction, having regard to the bearing this matter has on the future safety in civilian and military flying?

Major-Gen. SEELY: Owing to the shortage of the best tried types of wood, the use of cypress for aeroplanes was for a time sanctioned by the responsible Technical Department on expert advice to meet war necessities. One fatal accident was held to be partly, but not wholly, attributable to the use of this wood, which has now been discontinued. The best independent expert opinion is already at the disposal of the Air Ministry on the subject of woods for aeroplane construction, and I do not think that there is any occasion for the appointment of a committee such as is suggested in the last part of the question.

CIVIL FLYING.

Mr. A. M. SAMUEL asked the Under Secretary of State to the Air Ministry whether permission to private owners to fly aircraft shall be accorded only subject to their insuring themselves against liability for damage, so that innocent sufferers may be certain of recovering loss for proved damage to the commission of which they have not contributed?

Major-Gen. SEELY: Every possible safeguard has been provided in the regulations for civil flying to prevent loss and damage to the public. The working of the Regulations will be carefully watched, but at present I do not think it would be advisable to adopt my hon. friend's suggestion.

Mr. A. M. SAMUEL asked the Under Secretary of State to the Air Ministry whether Government-owned and privately-owned aircraft are liable in times of peace for damage accidently done by them to life and property?

Major-Gen. SEELY: There is now no special law applying to damage done by aircraft, and therefore responsibility for damage of the nature referred to in my hon friend's question must be determined by the ordinary law unless and until fresh legislation is made.

AIR ROUTES (PORTSMOUTH).

Major Sir B. FALLE asked the Under Secretary of State to the Air Ministry why Portsmouth, the first naval port and dockyard of the country, has been left out of the scheme of the Air Ministry; and if he is aware that Portsmouth is one of the largest towns on the South Coast and has some magnificent alighting ground for aeroplanes?

Major-Gen. SEELY: There is no fully-equipped aerodrome in the immediate vicinity of Portsmouth. The air routes recently published are based on existing aerodromes where facilities in the shape of accommodation and personnel may be made available. Should the Portsmouth borough authorities have in view a suitable site, an officer of the Air Ministry will be sent to view it and discuss the possibility of its inclusion in the list of approved aerodromes.

AEROPLANE WINGS (DOPE RECOVERY).

Col. Sir ALEXANDER SPROT asked the Under Secretary of State to the Air Ministry whether the plant which the Government was in process of erecting at Farnborough last autumn for the recovery of dope from scrap aeroplane wings has been completed, if so, has it been decided to work the plant; if not, are the Government going to sell it; what sum has been expended on the plant; what quantity of scrap fabric has been treated; has the recovered dope been found satisfactory; why are the Government selling off the scrap to the public when they have a plant for recovery of the dope; and what is the name of the official in charge of the plant?

Mr. KELLAWAY: The plant in question has not yet been completed; when completed it will be worked by the Government. Up to the present a sum of about £1,500 has been expended on the plant. Only a small quantity of scrap fabric has so far been treated experimentally. The treatment has proved successful. The officer at present in charge of the plant is Dr. J. E. Ramsbotham.

THE CANADIAN AIR BOARD.

In the Dominion House of Commons the Government Bill creating an Air Board to control aeronautics in Canada was read for the first time. A Minister of the Crown will preside over the Board, on which will be represented the Departments of Militia and Naval Service. Authority will be given to the Board to make the necessary regulations to undertake technical research and to grant licences to pilots and for commercial services.

AERONAUTICS and The LAW

A REMARKABLE COINCIDENCE.

There must be telepathic communication between Mr. J. T. Tussaud and **"The Imp"!**

The former, on May Day, told in the "Evening News" the story of his purchase in 1898 of certain copper plates etched by Queen Victoria and the Prince Consort.

On the previous day was published in THE AEROPLANE an account by "The Imp" of the stir in Society and the Courts made by the threatened publication of etchings from just such copper plates in 1848.

The coincidence does not stop there. For "The Imp" in his article happened to refer to Mr. J. T. Tussaud in another connection, yet had not the remotest idea that Mr. J. T. Tussaud even knew of these etchings, nor did "The Imp" himself know of the existence of the copper plates!

Some curious legal questions are raised by Mr. Tussaud's disclosures. It appears that all public knowledge of the artistic efforts of the Queen and Her Consort in the production of these etchings was intended to have been prevented, and the etchings and a descriptive catalogue of them consigned to oblivion by the various injunctions obtained against the defendants Strange and J. T. Judge.

SOME CURIOUS LEGAL QUESTIONS.

Can His Majesty the King claim to recover those plates which on the authority of Prince Albert v. Strange and the admission of Mr. Tussaud were etched by His Grandfather and Grandmother, and up to 1848 had never been published by them nor are likely to have been since? Or if the King cannot claim their possession can he claim to have them destroyed? Can he claim destruction of all copies of the "Evening News" which contained Mr. Tussaud's article? Is it not as much a description of the etchings as the catalogue printed by Strange?

Yet another point. The compiler of the catalogue, J. T. Judge, seems to have confined himself to eulogy.

"This royal and most interesting collection is now submitted to the inspection of the public under the firm persuasion and in the full confidence that Her Majesty's loyal and affectionate subjects will highly admire and duly appreciate the eminent artistic talent and acquirements of both Her Majesty and her illustrious Consort His Royal Highness Prince Albert.

"You must not be the grave of your deserving; England must know
The value of her own. 'Twere a concealment
Worse than a theft, no less than a traducement
To hide your doings."
—SHAKESPEARE.

"CONSCIENTIOUS WORK."

Mr. Tussaud ventures on criticism:—

"Although not altogether faultless, from an artistic point of view, the work is most conscientiously executed, showing how painstaking was the Queen even in comparatively trivial matters."

Is that a libel? Fair comment, mayhap, but can it be said to be "on a matter of *public* interest"? The subject-matter of the criticism was an unpublished work which the Courts in 1848 held thte authors entitled to withhold from all *public* description. There seems little ground for supposing that the authors subsequently abandoned this right.

These legal conundra are doubtless of merely theoretical interest, seeing that Mr. Tussaud deserves congratulation and not censure for his acquisition of the copper plates and for his interesting article in which he gives an account of them.

The legal importance of Prince Albert v. Strange is that it established the right of the author or composer of any unpublished work to withhold it from publication.

Its interest in connection with aeronautics is illustrated by a case put in tthe course of the argument. "If a party publish a drawing of a house or a tree belonging to another person, can the owner restrain him by an injunction because his privacy was invaded?" If a paper publishes air photographs of private houses, private crashes or parks, can the owner restrain such publication on the ground of "Mind your own business"? Seemingly not, but the taking of aerial photographs and their reproduction for gain is a legitimate enterprise open to all the world now that flying has become general.

THE LINCOLN IMP.

THE USQUE AD CŒLUM DOCTRINE.

The following interesting letter has been received:—

Sir,—The article in the March 12th issue, as a complete refutation of the "usque ad cœlum" doctrine, however interesting in its research, is, to say the least of it, inconclusive and incomplete.

The matter requires careful consideration. The doctrine is far too deeply embodied in our law to be lightly brushed aside, and Parliament is essentially wise in seeking to deal with it betimes.

It presents two aspects of vital importance to the future of Aerial Navigation, viz. (1) the private rights of private owners and their lessees, and (2) the territorial sovereignty of the State or the right of the National State to assert its territorial sovereignty and control over the air spaces above its dominions terrestrial and aqueous.

This latter is of the utmost importance in relation to all world flying and commercial enterprise in the air.

Should the "usque ad cœlum" doctrine be asserted by National States of perfect and also of imperfect sovereignty? Few can doubt that its assertion and maintenance is essential to the adequate preservation of national security. The experiences of the war, and the great developments of the art of photography, which renders it possible to obtain accurate impressions of the earth at any altitude, are alone sufficient to demonstrate the need of such assertion.

No State of perfect sovereignty, especially one obsessed by the ideas of aggression such as prevailed in Germany before the war could, without loss of status, surrender such an essential attribute of its sovereignty. The "usque ad cœlum" doctrine, both from an international and from a commercial point of view, must in the future become one of ever-increasing importance. From a commercial point, in the loss of time which must be involved in the interruption of flights if, in the absence of international conventions to the contrary, aircraft carriers of goods or passengers, are compelled, by the municipal laws of the several Sttates over whose territories it is necessary to fly on any given voyage, to land at the frontiers, and make reports of themselves and their mission, and subject themselves to customs house inspection.

From a rational point of view, for the reasons of which those already indicated seem sufficiently to illustrate the importance, our own Government, fully alive to these considerations, has fully and effectively asserted its sovereign rights, "usque ad cœlum," and with such an example of the vitality of this maxim of our law, he is a bold writer that sets himself the task of its "complete refutation."

To-day our law prohibits, in asserting its complete sovereign rights, all flying or aerial navigation, except such as it expressly authorises or permits, in the air spaces over the whole area of the United Kingdom, and over the whole coast-line and territorial waters thereof.

Aircraft coming from abroad are expressly prohibited from entering the kingdom at any point save only such as are definitely chosen and assigned to be such entrances; and even then are subjected by our law to complete State control at the moment of commencing the voyage, at the moment of reaching the frontiers of our land, and in their future movements and flights in, through, and about the air spaces over our land. So vigorous is the assertion of our territorial sovereignty, "usque ad cœlum."

Private rights in this matter are but derivative from the greater right of national sovereignty. For whatever private rights exist in the air or in the infinite spaces above the earth through which the air moves such private right of ownership or possession must be originally derived from the sovereign rights.

Where the sovereign or those who held under him made grant of land or its surface, he, according to our law, parted with the subjacent earth in the shape of soils, minerals, waters not flowing in defined streams; but did he part with the air, and the superincumbent atmosphere, did he part with air spaces lying above and resting upon the land surface subject of his grant?

"The ordinary rule of law is that whoever has got the solum, the site, is owner of everything up to the sky and down to the centre of the earth." So said Vice-Chancellor James in 1870, in a very interesting case relating to conflicting claims of ownership to the superincumbent air and air spaces lying above a site in Eastcheap and Philpot Lane.

So, again, in 1901, when a railway company claimed the right to maintain telegraph wires over a piece of land under which they had rights of tunnelling, and in respect of which wires they had previously made judgment to the defendant, owner of the solum or site, under agreement with him, it was said: "That ownership of the surface gives ownership of everything above

the surface and of everything below, cujus est solum ejus est usque ad cœlum." And Mr. Justice Byrne held that possession of the surface prima facie gives title to all above and below—and that the defendant had shown title to the surface and *the space* above, and had actually exercised such a right of ownership *in the space above,* as to have leased a right to the plaintiffs themselves to carry wires over the land.

And so of old time it has been held and written that the maxim is good and forms a principle of our law. So in 18 Ed. III a man had his writ of nuisance, for that a neighbour had built a house over and above the spouts of the plaintiff's house, and so in 8 James I judgment was given for plaintiff in nuisance for that defendants had built a house overhanging part of the plaintiff's house, and by overbuilding had deprived plaintiff of the air and prevented him from building his own house higher, and the maxim expressly referred to and applied.

Ownership and possession of the superincumbent space lying above the site is essential to the full enjoyment of the site or surface of the earth itself. That is the foundation upon which the essential justice of the rule depends.

The spaces above are vertically incapable of limitation. At what height, or at what point in space, can boundaries be fixed? The pathless, boundless spaces are in this aspect incapable of local limitations. The rights of private owners in all such spaces of the air are not only recognised by our law, but are protected by action lying in trespass and nuisance, and infringements of them restrained or compensated by damages or injunction.

So in the Eastcheap-Philpot Lane case. Not only was the action based on trespass, and an injunction claimed, but by the order of the Court a declaration of ownership was made. So, also, in the telegraph wire case an injunction was granted to restrain the railway company from entering and trespassing upon the land and from permitting to remain over *or above* the land any telegraph wires or lines or other things belonging to the company.

But in the air itself it may be doubted whether there is any property. The rights to air is analogous to those in running water. There is no private ownership in them. Though in this the cases are not all easy to reconcile in relation to air.

The water of a running stream is publici juris each successive proprietor has a right to use it in passing, so that he does not foul it for his neighbours, but it is the property of no man. It is in perpetual motion, and is not susceptible of appropriation, and if it were, as it has rightly been said, it would be greatly to the detriment of the public interest that it should be so brought into private ownership.

So also is it with light and so also with air. Baron Parke puts it that "These also are bestowed by Providence for the common benefit of man, and so long as the reasonable use by one man of this common property does not do active and perceptible damage to that of another in a similar use no action will lie."

A wrongful use which would amount to or create a nuisance would be restrained or damages granted. But any claim of right to ownership of the free untrammelled currents of the wind and the air cannot be sustained; neither can any such be acquired or created by prescription, grant or covenant, unless perchance it be to some current of air passing through some definite and restricted channel. And so Lord Justice Brook puts it in Harrod v. De Pinner, 87 C.D. 262. "The passage of undefined air gives rise to no rights." So, also, it was held in Webb v. Bird, in 1861, and confirmed in Exchequer Chamber, that the right to the passage of air is not an exitant, and that a grant of a right to the free and uninterrupted passage of the currents of wind and air cannot be presumed.

It may, however, be pointed out, that there are from time to time various dicta and opinions expressed, the language of which might justify the contention that private rights in the air itself or in a column of air vertical above a close are recognised by our law.

It may be that these go too far, but it is noticeable that in 1870 Vice-Chancellor James in the Eastcheap case found that the owners of the house in Eastcheap were the owners of everything else, including *"the column of air"* upon which the trespass was supposed to have been made, and actually made an order as to the ownership and proprietary right in "the column of air above the site."

These matters are of great public and commercial importance at the present day, whether the word public connotes the State or the generality of the community. Trespass to property or person, and nuisance may easily arise in multitudinous forms as the result of aerial navigation. Remedies by damages and injunctions must be preserved. But the commercial needs of a new and far-reaching system of transport must be provided for, and private rights must be limited to give scope to these, when they come into complete antagonism.

Thus it might wisely be provided that the mere flight of aircraft through the air spaces over the land should not of itself in our law constitute a trespass, or give right to a cause of action.

The principle, not the tag, "cujus est solum ejus est usque ad cœlum" is active, vigorous, and must be maintained.

H. Bickmore.

RESCUED BY AIR.

A STORY OF AERIAL ADVENTURE.

[Fiction daily becomes more technical and more inaccurate. With which preliminary observation, and without any apologies to the daily, weekly or monthly Press, the following story is inflicted upon a long-suffering public.]

Rupert and Bertie had been bosom friends ever since—as "joy-sticks"—they had together learnt to fly at Adastral House. Rupert was, perhaps, the finest pilot that even this celebrated school has yet produced. Few could fly so high or so fast, and none could fly so long.

Usually the first to leave the aerodrome (as the big tent that houses all the machines is called), he was invariably the last to return. There could be seen no finer sight than Rupert descending in a spinning nose-dive.

Bertie was nearly as good a pilot, but he suffered from laziness and would frequently let Rupert tow him home rather than have the trouble of flying his "motor-bus" himself.

Many were the adventures these two had in their journeys over Potsdam. Sometimes they would meet with a Fokker, as our aviators call the gigantic German triplanes, and then—pausing only to light cigarettes—they would bank towards the foe and send him crashing to the earth, using either the deadly incendiary bombs or the camera-gun which shoots and photographs the enemy simultaneously.

It is hardly necessary to say that both had been decorated, Bertie with the Military Order and Rupert with the Distinguished Service Cross.

One morning Rupert walked into the dining mess. He was the "quirk" or junior Flight Lieutenant in the Wing, yet such was the respect he inspired that all rose on his entrance.

"Cheero, old things!" said Rupert. "Where is Bertie?"

"On duty, I fancy!" replied a grave looking Flight Sergeant, "for I heard him order his 'plane.'" Rupert touched the bell—a subaltern appeared.

"My Blériot, please, at once!" he cried, as he donned his goggles. Rupert saluted, and left the dining mess.

When he reached the "hangar," or flying ground, willing hands were at work on his aeroplane; one man was inflating the wings, another was doping the carburettor, while others were seeing to the thousand and one things so necessary before a flight is made. Rupert climbed into his seat and adjusted his parachute.

"Switch off!" cried the head air mechanic, who had the reputation of being the best Squadron Commander in the Royal Flying Service. "Contact!" answered Rupert, who was always scrupulously particular in these little matters of drill. The engine gave a roar and he left the ground.

Up and up he soared until he was but a speck to the watchers below. He glanced at his "pitot tube"—the needle pointed to 10,000 ft. He lighted his pipe and lay back comfortably in his seat, as the "plane" headed straight for Berlin. "I wonder where old Bertie is!" he kept saying to himself, but not a sign could be seen of Bertie or his fast Wright monoplane.

An hour's steady flying brought him to the Prussian Capital. For some time he hung motionless, scanning the busy streets below. Then suddenly his gaze became rigidly fixed on the Unter den Linden. Surely he knew that walk! Yes, it was Bertie! His chum was being led in chains to some place of execution. With Rupert, to see was to think—to think, to act. Pushing forward his throttle and closing his control lever, he dropped like a stone. When within a few feet of the ground, he looped twice to attract Bertie's attention.

"Quick, Bertie!" he shouted. "There is not a moment to lose."

Recognising his chum, with a shout of joy Bertie turned round quickly and stunned the nearest of his escort with the butt end of his sword; the man fell dead. Meanwhile, Rupert, steering his aeroplane with one hand, with the other took a machine-gun from its holster and shot the remainder of the escort with unerring accuracy.

"Jump in, old hat!" shouted Rupert, and then he remembered Bertie's chains. There was only one thing to be done. "Stand quite still, Bertie!" he cried, and took careful aim. There was a loud report, the noise of falling fetters, and his friend stood free. Without waiting to be told, Bertie vaulted over the empennage and into the tail boom, where he calmly sat down and lighted a cigarette. Rising in a steep spiral, Rupert headed for home. The game was won!

They landed and went straight in to dinner.

"Did you manage to wangle any stalls?" asked the Sergeant Major.

"A few!" answered Bertie.

"And you enjoyed yourselves?"

"Oh! Not half!" responded Rupert with a merry laugh. "We had quite a cushy strafe!"

G. K. G. K.

PARIS NOTES

PARIS, May 3rd.

THE EXIT OF COLONEL DHÉ.

There is general regret in the aviation world here at the sudden exit of Colonel Dhé, because he was a man who was not content to let his department be run by his bureaucratic subordinates. There is no great resentment at the choice of General Duval for the post of Director of Aeronautics, as he did excellent work as Chief of Army Aeronautics during the war, but it is felt to be a retrogressive step to appoint a man noted for his "militariness" to be in charge of aviation at a time when every effort should be made to put commercial and civilian aviation in the ascendant position.

A GIANT HYDRAVION.

It is probable that the first French machine to attempt a North Atlantic crossing will be a giant hydravion constructed near Bordeaux. Successful trials have already been carried out. It has a span of 23 metres, a length of 13 metres, and a central hull. It can carry 2,000 litres of petrol, and its motive power is a 500 h.p. Sunbeam, turning a four-bladed airscrew. Burri, a pre-war aviator, carried out the trials. It was constructed by Messrs. Bonneville, Musset, Dufau, Caussegne.

A SAFETY DEVICE.

Messrs. Voisin have lately constructed a non-inflammable petrol tank, the invention of Messrs. Quintric and Lemort; its first trials are reported to have been successful.

The Voisin firm have a new four-engined machine on the stocks. It is designed to carry sixteen passengers, at a speed of 150 kms. an hour.

A monument is to be erected at Vichy to the memory of Gilbert; the sculptor is M. Georges Dubois.

The "Ligue des Pilotes-Aviateurs" have just published their twelfth list of members, which takes them from 1550 to 1600.

M. Esnault-Pelteries' works at Lyon-Monplaisir are constructing a large aerobus with three motors, which is intended to transport mails and passengers.

Every week one is advised of the formation of new companies intending to exploit various routes for aerial transportation. The latest of these is "La Compagnie Aérienne Française," whose offices are at 126, Rue de Provence, Paris, the first administrators being Messrs. H. Balleyguier, Cahen-d'Anvers, A. Caron, F. Gros, P. Lescop, E. Pierra, and F. Robbe.

Mme. Jane Hervieu intends to attempt to make a height record as soon as the present bad weather has passed.

THE OFFICIAL WAY.

When the authorities here are reproached regarding their slowness in organising civilian aviation they reply, "Wait a bit. War machines must undergo modifications which cannot be done in one day," but when it is suggested that the Huns be allowed to keep a few aeroplanes just to satisfy them, these same authorities object. "Stop," they say. "Don't you know that in one night a civilian aeroplane can be transformed into a war machine?"

CIVILIAN AND COMMERCIAL AVIATION:

The death of Védrines did not prevent the Goliath taking her usual complement of passengers to Brussels and returning with an equal number last week-end. The trip was undertaken notwithstanding the bad weather.

CRUELTY TO AN AEROPLANE.

M. Gainot's aeroplane, piloted by Constantini and carrying ten passengers, of whom two are ladies, has arrived at Toulouse after jaunting over most of southern France. It is now being tuned up afresh in M. Latecoère's works. This was necessary because Constantini has a habit of leaving it out in all weathers. One would not treat a motor car in such a brutal fashion, so why an aeroplane, which is considerably more fragile and susceptible?

ADVENTUROUS FLIGHTS.

The three Italian pilots who crossed the Alps last week recrossed last Thursday. They left Lyons when a 45 m.ph. wind was blowing, encountered a snowstorm, and landed near Turin after two and a half hours' flight. They were on a 600 h.p. Caproni military machine.

SWISS CIVILIAN AVIATION.

On April 28th the aerial post commenced between Dubendorf, Berne, and Lausanne. The first machine left Dubendorf at 10.30, reached Kirchlindach Aerodrome at Berne at 12 midday, Lausanne (Blecherette Aerodrome) at 1.15, left again at 3 o'clock, reached Berne 3.50, and Dubendorf at 5.20. The transference of mails and packages between the aerodromes and the stations of Zurich, Berne, and Lausanne is carried out by motor-cyclists. Packets or letters must not exceed 250 grammes in weight, and are charged a surtax of 50c, which is indicated by a special aviation stamp which shows in red the badge of military Swiss aviation. The aerial post can also be used for the conveyance of newspapers. The surtax is not reimbursable if the flight is not made or only partly made, but packages will be sent on by the next mail train.

THE FUNERAL OF VEDRINES.

In the presence of a large crowd the earthly remains of Védrines were laid to rest with Military Honours in the Pantin Cemetery, Paris. His mechanic, Guillain, was buried with him. The same day as they were buried, the "Journal" published what is undoubtedly the last article he wrote, and in which he rendered homage to Pégoud, whom he described as the man who taught the world how to fly. He thought that without the stunt flying of Pégoud, France would have been deprived of the prowess of Fonck, Guynemer, Nungesser, etc.

A FALSE MOVE.

There seems but little doubt that Védrines' fatal accident was due to a false manœuvre on his part. As has already been explained, Védrines, diverted from his pre-arranged itinerary, was following the valley of the Rhine with a very strong wind in his direction of flight. It must here be stated that Védrines, in piloting a machine of the size of the C23, was as much out of his element as would be a motor cyclist driving a five-ton lorry for the first time, and it is common knowledge here that the C23 is not the easiest machine of its class, especially with regard to its landing qualities. Whilst Védrines was flying at a fairly low altitude his right-hand motor failed completely, and, loaded or superloaded as the machine was, he was unable to sustain his altitude, so decided to land. The only suitable ground that he could see was a clover field, with a vineyard touching one side and impossible fields on the other.

From the point where his motor stopped Védrines commenced a wide circle, a flat left-hand turn, losing altitude the while. He seems to have commenced jettisoning various removable articles and to have started to empty his right reservoir, and probably tried to continue his second left-hand turn, in order to land in the clover field face to wind, but being much too low for this, he was obliged to land in the vineyard in front of the clover field either on one wing (probably the right) or on the wheels, no one will ever know, and subsequently overturned and was killed by being pinned underneath an engine.

Unfortunately within two hours of the accident the local populace had souvenired two-thirds of the removable "bois cassée," leaving only the longerons, wing spars, motors and things too heavy to be carried away.

The C23 has a landing speed of 80 kms. per hour normally; the wind was blowing at 40 k.p.h., which meant that Védrines landed, with a machine superloaded, at 120 kms. p.h. instead of 40 kms

A PROBLEM TO BE SOLVED.

The advent of the multimotor machine was hailed as the saviour of aviation, inasmuch as, should one motor stop, it would not be necessary to land, or if one decided to land then the other or others would be sufficient to provide control over a machine manœuvring for position. It would seem, however, that, on the contrary, the multi-engined machine opens up problems of its own, at any rate as regards navigation. Védrines, deprived of the power of his right motor, made a left-hand turn. Was such a manœuvre correct? Some pilots believe that when one motor stops, to avoid a spin one should turn "on" the working motor, i.e., use it as the pivotal point on which to swing round the rest of the machine. Surely this is a point the correctness of which it is advisable to establish without further delay?—F. T. N.

The Explosion of "Forlanini 5."

The complete destruction by an explosion of "Forlanini 5"—the last but one of the series—while having the top of her envelope attended to in her shed at Baggio, Milan, after a complete overhaul and the fitting of more powerful engines, is on a par with all the other unlucky and inexplicable disasters which have persecuted Ing. Forlanini.

The O.C. (Major Priccolo) and the O.C. the station (there are three hangars, in one of which F.6 is housed) both state that no engine was running at the time. The officers and crew were all in the shed, and the ship was nearly ready for trials of the new arrangements and improvements.

As was the case when the "City of Milan" exploded, the people in the vicinity were not hurt, but three unfortunate men on the top of the vessel lost their lives.

F.5 took an active part in the war, and had carried out 29 bombing raids. She displaced 18,000 cubic metres, had a speed of 78 kilometres an hour with only 500 h.p., and had carried 60 people. She dated from 1917.—T. S. H.

BRAINS versus SUPERFICIAL SMARTNESS.

"The Imp" likes the "Snipe." There is no shilly-shally about him. He does not damn with faint praise. Nor praise with faint dams. He just dams and there is an end o't. To parody his C.O., he calls drilling and discipline "a lot of d——d theoretical rot." His band of enthusiastic civilians were "handicapped more than helped by the purely military element."

The "Snipe" is absolutely right in what he says. He speaks as one "who has been through the mill and from practical experience." This claim rings very true and his illustrations simply reek of petrol and oil.

What the "Snipe" Omits.

But the "Snipe" is absolutely wrong in what he omits. He speaks as an advocate to demolish his adversary's case and put his own on a pedestal. His advocacy is of a high order. But over-fervent for a judge.

In this age-long controversy about discipline "The Imp" does not claim to be impartial. The bias of his mind may safely be left to the discernment of the reader. But he believes he can see *cons* as well as *pros* on each side. And he would like to temper with mercy the stern denunciations of the "Snipe."

The "Snipe" was as fortunate in his civil associates as he was unfortunate in his military. Let us regroup them under the two heads.

The tradesmen he was set over were good at their trades, first-class fitters, expert engine-tuners, satisfactory and skilled mechanics, bright original minds, men of natural talent and equally natural enthusiasm. In spite of physical deformities and poor physique, at their own work they were enthusiasts; their hearts were in their jobs; there was no grousing over long hours. The technical officers, too, were highly specialised, and the pilots well qualified.

A Lot of D——d Rot.

But the soldiers were wash-outs. The C.O., though an officer of a very famous infantry regiment, wounded in 1914, thought theory "a lot of d——d rot," believed in smartness before brains, habitually abused the men under his command in language unbecoming, etc., and was guilty of a piece of great inhumanity to one, at the least, of them.

The Adjutant was a pilot who had succeeded in obtaining a ground job, and was determined to keep it; he made a hobby of fire drills on the busiest mornings, and for his serious work dispensed daily hell in penny numbers with a twopenny edition on Sundays. A notorious Serjt.-Major was specially obtained to assist in keeping the station incandescent, and nobly earned his pay in this task. Of the intermediate ranks the "Snipe" tells us nothing, but the few airmen who were soldiers, were mechanical wash-outs.

Youthful Adjutants.

The "Snipe" encountered also other Adjutants, pilots aged about 22 years who had lost their nerve for flying, carried little weight with other pilots, had no natural dignity nor influence with the men. They were only made Adjutants because they had no special knowledge to enable them to qualify for the technical branches, and as they assumed a hectoring attitude they were cordially disliked by everybody. Truly the "Snipe" was not fortunate in his military associates!

To quit irony for a moment, "The Imp" agrees with the "Snipe" when he claims there is no exaggeration in this account. It is the truth. It is nothing but the truth. But it is not the whole truth.

"The Imp," too, has been through the mill. He has belonged to "a b—— rabble," has subscribed to the penny numbers of hell, and has not escaped the twopenny Sunday coloured edition. He has had more than a bowing acquaintance with the gentry the "Snipe" so vividly portrays from the C.O. to the clockwork soldier-man who is a mechanical wash-out. He has found it impossible to make capable men understand why they should spend valuable time over drill or cook-house fatigue, or to enjoy it himself or derive much benefit from it.

"The Imp" More Fortunate than the "Snipe."

But, more fortunate than the "Snipe," "The Imp" has been commanded by an ex-Army Officer, who had also been an Adjutant, and who was *not* "about 22"; who, having a ground job, was *not* "determined to keep it," but spontaneously flew on active service; he did not think theory "a lot of d——d rot," but encouraged it greatly; he believed in both smartness and brains, never abused the men under his command (but broke them if need be), and though strict and severe was never guilty of inhumanity. His hut having caught fire, "The Imp" ventured to ask him whether it was by spontaneous combustion and was not dismissed His Majesty's Service with ignominy! Though a strict disciplinarian, he had a mania for work but not for drill.

The Discipline of the Guards.

"The Imp," unlike the "Snipe," knows an ex-Guardee Adjutant to whom the discipline of the Guards is a sacred subject, and that of the R.A.F. an obscene one. Though a sorely wounded Infantry Officer, and not a tired Pilot, he occasionally flies as an Observer. His occasional drills are not made a hobby and his conception of the duties of an Adjutant appears to comprise help instead of hindrance of others. Finally, though severe and exacting, and, to "The Imp's" view, sometimes stubborn, he inspires fear without profanity, in which he never indulges.

"The Imp" has known several disciplinary Serjeant-Majors, and doubts if any of them can have been called popular while he held that position. But he has heard good spoken of some of them after they had left it. He never met quite such a brute as the "Snipe" had the misfortune to encounter, and hopes he never will.

Smartness that is not "Eye-wash."

"The Imp" has been hit by the lead which the abnormally smart saluting-man was swinging. It is now beginning to dawn on him why the smart soldier was never without the equipment which "The Imp" was accused of having "lost by neglect." But "The Imp" has also met soldiers whose smartness was not eye-wash, but a personal asset of great value, to them and to others, though, no doubt, painfully acquired.

The R.A.F. is a field full of tares which some enemy has sown. But it is a wheat-field all the same, and will ripen to harvest. Give it all the sun that you can, yet it will still need the discipline of the frost and the rain. Burn the tares later on.

The problem of the R.A.F. is the problem of personnel, i.e., the problem of character. Honesty of purpose seems to "The Imp" the only golden key which can unlock the closed door of its future. It possesses one supreme advantage over every other branch of the Service in times of peace. It is possible for it to employ that acid test of character—danger.

The Lincoln Imp.

ARTISTIC VERISIMILITUDE.

The following paragraph may brighten a dull moment:—

War-swept France to be Shown at Kelly Field.

On the evening of April 12th a great aerial program will be shown on Kelly Field, during which the horrors of war, as carried on by the Huns, will be depicted in the aerial bombardment of defenceless cities, the looting and burning of homes, and the carrying away of captives of the peoples of these cities. Never before in America has anything of the kind ever been shown. The performance will start at twilight, just as the people are returning to their homes. As night falls the city will be shelled by heavy artillery, followed by a bombardment by German planes. As the houses burst into flames, the enemy troops will charge into the city, capturing and killing the people. But while the enemy planes hover over the city on their mission of destruction, a squadron of Allied ships will suddenly sweep down from the sky and attack them. During this battle of the air every strategy known to defensive and offensive aerial combat will be enacted. As the Battle of the Clouds draws towards an end, with the Allies victorious, the American infantry will "go over the top" and drive out the Huns.

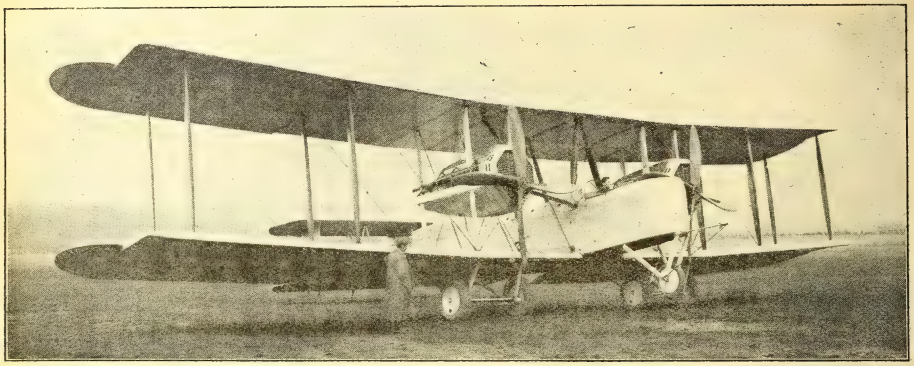
[The foregoing paragraph is taken from an official publication of the American Air Service, and illustrates excellently the difference between American methods and those prevalent in this effete old country. One can imagine the popularity which would be obtained if a similar demonstration were arranged at, say, Hendon or Hounslow, and the number of volunteers that there would be for the imitation Hun army if the lootings, burning, and carrying away of captives were permitted on a thoroughly realistic scale.

One is under the impression, despite this paragraph, that something very much of the kind, except for the aerial bombardment, has been seen in America on a variety of occasions when that country has been in a state of war, but America has one's sympathy in not having also had the privilege of being bombed from the air as have the countries of the European belligerents. At the same time, one cannot recall an instance in which the Huns have bombed defenceless cities. One is under the impression that all *our* cities, at any rate, have been rather heavily defended. If they have not, it has been the fault of the Government of the country, and not the will of the people.

An interesting point arises as to how the spectator was to witness this great battle in the air, seeing that the demonstration was to start at twilight, the town was to be shelled at nightfall, and the aerial battle was to take place afterwards. It is also curious to find (in an official military publication) that strategy is to be included—and in a dog-fight at that. One has always understood that operations in a dog-fight concerned tactics rather than strategy.

The final sentence, at any rate, conveys the idea that the demonstration will be true to life in demonstrating the American infantry going over the top with the Allies victorious. One only regrets, for the honour of the American Army, that the American infantry did not go over the top when the Allies were other than victorious and had greater need of their support.—Ed.]

THE TRANS-ATLANTIC COMPETITION.



The Vickers "Vimy" Biplane (two 350 h.p. Rolls-Royce Engines) now entered for the Atlantic Flight.

So far better news is to hand concerning the various competitors. It was stated on several occasions during the week that the Martinsyde and Sopwith machines were to start, but always the weather was against them, and no start was made.

The American Naval flying people who are to attempt the flight have made a great deal of show with announcements concerning test flights, preparations, and various measures for safety, but when one comes to read these accounts more closely the similarity to a hundred other and previous accounts is very forcible.

Dr. Alexander Robinson, the Postmaster-General at St. John's, is stated to have sealed a mail and handed it to Mr. Raynham for conveyance across the Atlantic. The stamps are specially surcharged "First Trans-Atlantic Aerial Mail" on the ordinary three-cents stamps. To prevent forgery each stamp is initialled by the Postmaster-General.

A Vickers Entry.

On May 5th, Vickers, Ltd., formally entered a "Vimy" biplane for the Trans-Atlantic Competition.

The construction of the trans-Atlantic "Vimy" has now been completed at the Weybridge Aeroplane Works of Vickers, Ltd. This aeroplane is practically similar in every respect to the standard "Vimy" Bomber as supplied to His Majesty's Government.

Two standard 350 h.p. Rolls-Royce engines are installed. The capacity of the petrol tanks has been increased to 865 gallons, and the lubricating oil tanks to 50 gallons, and with this quantity of fuel the aeroplane has a range of 2,440 miles. The maximum speed is over 100 miles per hour, but during the flight across the Atlantic the engines will be throttled down to an average cruising speed of 90 miles per hour.

The span of the "Vimy" is 67 feet, and overall length 42 feet 8 inches. The chord of the planes is 10 feet 6 inches.

A wireless telegraphy set capable of sending and receiving messages over long distances will be carried, and the pilot and navigator will wear electrically heated clothing.

The pilot is Capt. J. Alcock, D.S.C., R.A.F., late R.N.A.S., and the navigator, Lieut. Arthur Whitten Brown, A.M.I.E.E., M.I.M.E., A.M.F.A.I.E., R.A.F.

The preliminary flights were successfully carried out at Brooklands Aerodrome, Surrey, by these two officers, who expressed themselves completely satisfied with these tests. The Rolls-Royce engines ran perfectly, and the aeroplane left the ground with its load of 4 tons of petrol and oil after running a very short distance on the ground.

The aeroplane has now been dismantled and packed in cases. It is awaiting shipment to Newfoundland, and will be accompanied by the pilot, navigator, and mechanics with their full equipment.

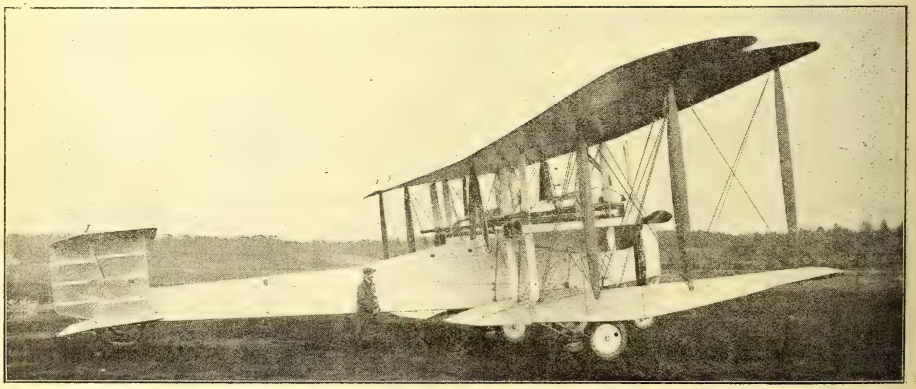
This machine is to be known in the future as the Vickers "Vimy-Rolls."

The American Machines.

Two of the American flying-boats were seriously damaged by fire on May 5th, just previous to their departure for Newfoundland. Two wings of the N.C.1 were completely destroyed, and the lower elevator and tail plane of the N.C.4 were badly damaged.

The fire was caused by a spark from an electrically driven pump falling on a drum of petrol, which took fire, the flames quickly spreading along the hose pipe leading to the N.C.1, which was in process of having her tanks filled ready for the start. The fire quickly spread to N.C.4 close by, and although the sailors, working regardless of danger, extinguished the fire in a few minutes, the inflammable material of which the machines are built burned so quickly that they were unable to prevent serious damage from being done.

It is stated that the machines can be repaired, but that the departure of the two damaged ones must be delayed.



Another View of the Vickers "Vimy" Biplane.

THE TARRANT TRIPLANE.

On May 5th the assembled Press of Great Britain was collectively introduced in propria persona to the giant Tarrant triplane, of which one has read so much in the Press recently.

Mr. Tarrant was well known to all Army people, if not to the mere public, long before he engaged in aviation, as the designer of the Tarrant Portable Hut, one of the neatest and most useful things of its kind. Mr. Tarrant has also to his credit a number of other extremely practical inventions all concerned with the efficient use of timber, so it was somewhat natural that he should ultimately turn his attention to aircraft construction. Of this particular form of aircraft construction, a more detailed account will be given next week. Meantime, it must suffice to say that the Tarrant triplane conveyed a very favourable impression as an engineering job, and one hopes to be able to record its aerodynamic successes before very long.

The Help of the R.A.E.

After visiting the machine the assembled company was entertained to lunch by Mr. Tarrant, who, like many practical people is a man of deeds rather than words. In reply to the toast of his health, proposed by Mr. Powell, Mr. Tarrant said that the machine had originally been designed for the express purpose of bombing Berlin, but that he hoped that it would be equally useful for more peaceful purposes. Mr. Tarrant laid particular stress on the very great assistance which he had received from everybody concerned with the Royal Aircraft Establishment at Farnborough in the construction of the machine. Mr. Sydney Smith, the Superintendent, had placed every facility at his disposal, and Major Turner, second in command at the R.A.E., had given an immense amount of his personal time and attention to the constructional work in the machine.

Major Turner, replying to the toast of his health, proposed by Mr. Tarrant, gave a most interesting and humorous account of the difficulties which they had met in building the machine and of the way in which they had been overcome, and he emphasised the fact that everybody at the Royal Aircraft Establishment was anxious to do their best to help forward the progress of aviation in this country.

Those who have long been connected with aviation will be interested to learn that the two pilots who are to carry out the tests of the machine are Captain F. G. Dunn, A.F.C., who will be remembered as one of the early pilots at Hendon before the war, and Captain P. T. Rawlings, D.S.C., who shared with Major Savory the honours and perils of the first journey from London to Constantinople in one of the early Handley Page's.

Very great assistance has been given in the detail design and construction by Captain T. M. Wilson, of the Air Ministry.

Technical Points.

The Tarrant triplane represents one of the many attempts at "Giant" aeroplane construction started during the latter part of the war. Owing to the Armistice, it is now being adapted for passenger and commercial work.

The root idea that predominates in the Tarrant machine is the adaptation of the principle of the "Warren" girder in wood, which allows of an immense amount of standardisation. The fuselage is built up on the German principle of formers spaced equally along a series of longerons, but in this case the longerons are constructed in the excellent and original Tarrant girder system, the whole being covered with two-ply and fabric.

The formers or rings are similarly built up on the Tarrant girder principle, and between them are an equal number of lighter formers. Although this construction is slightly heavier than the more conventional form of wire-braced fuselage, the additional strength obtained from the girder construction, coupled with the entire absence of cross-bracing wires, lends itself more particularly to commercial and passenger work, where the absence of any internal cross-bracing, etc., is a decided advantage.

The fuselage is attached to the wings between the middle and bottom planes by means of two sloping centre struts which pass right through the fuselage, meeting at a point at the centre of the lower plane.

The top and bottom planes are of equal length, but the middle plane has an overhang which is braced to the upper end of the outside set of interplane struts by a pair of struts. Balanced ailerons are also fitted to this middle plane, the balanced portion extending the whole length of the aileron. The total span is 130 feet.

The interplane struts are continuous, passing through the middle plane, thus giving greater rigidity to the whole structure.

The Power Plant.

The power units consist of six Napier "Lion" engines of 500 h.p. each, mounted three on either side of the fuselage, two tandem-wise on the lower plane driving a pusher and a tractor respectively, and one on the middle plane, directly above the lower engines, driving a tractor airscrew. The engines are started on the well-known Napier principle, and can be completely controlled from an engineer's switchboard immediately in rear of the pilot's cockpit.

Under the floor of the engineer's cabin is the main petrol collector, and provision is made for the engineer to climb out onto the wings through a hatchway, so that he can attend to any small adjustments to the engines as may be necessary.

The Controls.

The tail unit is of the biplane variety, fitted with an inter elevator between the main elevators. The inter and lower elevators are both balanced, and are inter-connected by struts, and are connected to the control column. The upper elevator is used solely for trimming the machine, and is controlled by two wheels, fitted low down on the right and left respectively of each pilot. The fairing of the inter-tail struts form the two fins, behind which are hinged two balanced rudders.

One separate undercarriage is fitted under each nest of engines, and consists of three wheels on an axle, which is carried at the centre of a beam. This is attached to another beam, which forms the lower member of the chassis structure, by means of shock absorbrs.

The two pilots are situated in the nose of the machine, the controls being completely duplicated.

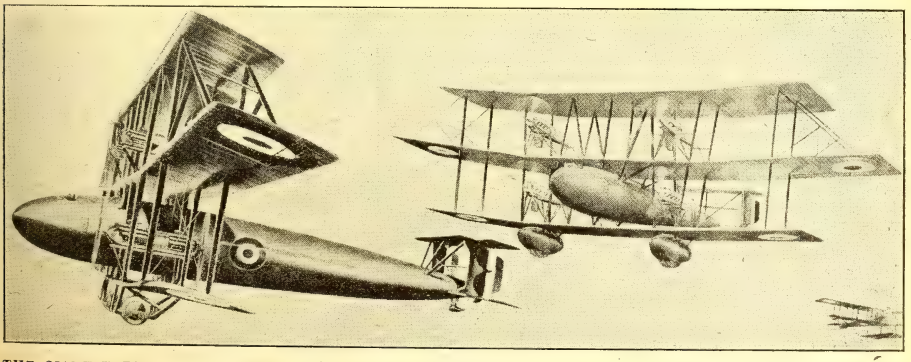
Ailerons are operated by means of a wheel with a sprocket and chain; elevators by a fore and aft motion of the wheel and control column, and the rudders by means of the usual rudder-bar.

At present the machine is being assembled in the balloon shed at Farnborough, which was, together with every assistance and facility, placed at Mr. Tarrant's disposal by the Air Ministry.

Obviously, the machine is rather too huge to be managed whilst on the ground by man-power, so that it is at present rigged on three trollies, one under each chassis, and one under the tail skid. These trollies run on railway lines out on to the aerodrome, the lines running in a shallow cutting so that the wheels are on a level with the ground, and the machine can take off the trollies direct into the air, assuming that the wind is in the right direction.

It is hoped that the machine will be ready for its trial flights in about a week or ten days' time the results of which will be watched with great interest.

One hopes to describe the machine in greater detail next week.



THE GIANT TARRANT TRIPLANE (Six Napier "Lion" Engines of 500 h.p. each). Schematic Drawings of the Side and Front Views.

A DISCUSSION AT THE ROYAL AERONAUTICAL SOCIETY.

In a recent issue of THE AEROPLANE there appeared extracts from a lecture on "Lighter-than-Air Craft" given by Lt.-Col. T. B. Cave-Browne-Cave, C.M.G., R.A.F., at a meeting of the Royal Aeronautical Society on March 26th.

The discussion that followed this lecture was so interesting that it was considered that more space should be devoted to it than could be given at the time. The report was therefore held over, and is now printed.

NON-RIGID AND RIGID TYPES COMPARED.

Mr. COLE said he thought those who had to do with the design of airships were convinced that the only successful development of lighter-than-air craft would be by means of the rigid type, or perhaps the large rigid, with the smaller non-rigid for certain purposes.

The Lecturer stated that the non-rigid airship, having no hull structure, would, if the same size as a rigid airship, have a considerably greater proportion of available lift. He thought no one but an enthusiastic amateur would think that a non-rigid airship could be compared with a high-capacity rigid. The maximum limit of capacity of the non-rigid was stated to be 500,000 cubic feet. The ability to carry a useful load equal to the weight of the ship was expressed as 50 per cent. disposable lift, but disposable lift was something like the League of Nations; it was talked about glibly, but few people knew exactly what it meant.

The Lecturer showed that it depended upon the difference between the density of the air and the hydrogen, and different authorities had different standards for that density. It was estimated at one time as 72.5; in 1914 it was assumed to be 68.6; the French used the figure of 70.14; and Col. Cave used 64.4. He (Mr. Cole) was taking 68 as the standard representing the actual conditions of airships in this country.

The weight of the machinery depended on the horse-power, and that depended on the speed required. The weight of the ship depended greatly on the speed for which it was designed. The maximum speed for the non-rigid shown on the screen was stated to be 50 knots, and the maximum speed for the rigid of the same capacity was 70 knots.

If one wanted to make the non-rigid of the size shown on the screen (340,000 cubic feet) up to the 70 knots, the engines would have to be trebled, and the disposable lift, instead of being 35 per cent., would be minus 20 per cent. Any comparison between the rigid and non-rigid on the basis of speed for weight was absurd.

The speed of the non-rigid was limited by the fact that the nose went in. As had been shown, it was necessary to stiffen the nose. A speed above 50 knots was not practicable for non-rigids. There was no limit for the rigid except as to speed for a given horse-power.

The Lecturer said there was much to be gained by carrying a given weight in several small ships rather than in one large one. That meant that it was better to carry a large load in several cross-Channel steamers than in a vessel like the "Mauretania," but a big ship was meant to carry a big load. The small airship was in danger of being overtaken by the large aeroplane.

There were rigids with a disposable lift of about 58 per cent., and they could travel 70 miles an hour. The Germans had designed one which would have a disposable lift of 80 per cent., but that was an expensive figure. We were only at the beginning of rigid airship design, and there was no factor to limit its development, whereas there was a limit to the size of the non-rigid.

MAJOR PRITCHARD'S CRITICISM.

Major J. E. M. PRITCHARD said Col. Cave seemed to have been led away by his natural enthusiasm for non-rigids into dealing almost entirely with that type, and this gave the false impression that the future development would be along the lines of the non-rigid, whereas the rigid would have a far greater future.

It was not to be wondered at that Col. Cave should be unconsciously biased in favour of the non-rigid, as he had been largely responsible for its development, until, at the time of the Armistice, Great Britain had a fleet of the most efficient non-rigid airships in the world.

A striking advantage of the rigid was its speed. Out of the six main factors in transport, viz., speed, cost, carrying capacity, regularity, safety, and comfort, the claim of aircraft for an assured future must be based on speed. The maximum speed for non-rigid airships was about 56 miles an hour, while the corresponding rigids had a speed of 77 miles, and a speed of 90 miles was in view with the larger rigids, while with non-rigids it was doubtful if a speed of more than 60 miles an hour could be obtained.

As the size of an airship increased the percentage of the gross lift necessary for machinery to obtain a given speed decreased proportionally to the two-third power. The latest type of 2¼ million of cubic feet capacity rigids possessed a disposable lift of 58 per cent., and a speed of 77 miles an hour had already been mentioned, against a corresponding latest type of non-rigid, with disposable lift of only 35 per cent. and a maximum speed of only 56 miles.

If the power units of the rigids were reduced so that their maximum speed were reduced to that of the non-rigids, the disposable lift would rise to nearly 70 per cent.

A rigid equivalent to Col. Cave's hypothetical 500,000 cubic feet non-rigid would have disposable lift 60 per cent. and speed 90 m.p.h., and, if it were fitted with engines to give only 54 miles an hour, a range of some 15,000 miles would be obtained, which could not be obtained by the 500,000 non-rigid, even if the weight of the structure were a minus quantity to the extent of over twice the gross lift of the whole ship.

This lack of range also affected heavier-than-air craft, and it was doubtful whether any heavier-than-air craft would be developed for some years to come which would have a maximum range exceeding 3,000 miles at a speed of, say, 90 m.p.h., and when the range was limited to a commercial range of about one-third the aeroplane and non-rigid became limited to non-stop flights of under 1,000 miles, with the balance of speed in favour of the aeroplane.

The advantages of the rigid were that no special arrangements had to be made to maintain pressure in the gasbags, which was difficult in non-rigids when making changes in height of 1,000 feet; a rigid ship of great length, being divided into separate components, could take up an appreciable angle without excessive pressure occurring at the upper end; ample and convenient stowage was provided by the keel, whereas in the non-rigid freight or fuel had to be stowed in cars or in fabric fittings in or on the envelope; a comparatively inexpensive outer covering prevented deterioration of the gas-containers from rain and sunshine, while in the non-rigid the envelope was exposed; and gaseous super-heating was less in rigids, owing to the air space between the outer cover and the gasbags.

LT.-COL. HECKSTALL SMITH'S VIEWS.

Lt.-Col. S. HECKSTALL SMITH said he hoped that was one of the first of many meetings they would have on the subject of airships. We were just on the verge of one of the greatest developments in transport that had ever been dreamed of, and that was transport by airship.

It struck him our airship friends were rather like the schoolboy who tried to add a nut to an apple and found the result was a lemon. Why the non-rigid and the rigid should be compared, or why the relative uses of the "Mauretania" and a lot of paddle-boats need be compared he could not understand.

Suppose he had to carry goods across the sandy desert where an aeroplane could not be used and the distance was not sufficient to warrant using a 5 million cubic feet or 2½ million cubic feet rigid airship, although the non-rigid could not compete with the rigid, it might easily compete with the camel both as to speed and disposable lift. It had also been suggested that a useful function of the non-rigid was travelling at night, when gas was not lost owing to the fact that the temperature was low. Where distances of only 200 or 300 miles had to be travelled, and the ground was impossible for aeroplanes, and there were no railways to compete with, the non-rigid airship might be used although one would not attempt to use it in flying from South America to the Cape or from the Cape to Australia—which would be a common route for airships in the future. That was especially work for the big non-rigid.

He was glad to see so many engineers present, as there was an immense amount of work for everybody on this great problem of the rigid, the non-rigid, and the aeroplane. Each had its own function, and they were not likely to be mixed up.

The Hun had been in front of us on airships and behind us on aeroplanes, and we were now rapidly overtaking him on airships. He had no doubt that, with the engineering knowledge this country possessed, we should go ahead.

CAPT. WALPOLE'S COMMENTS.

Capt. G. S. WALPOLE said he spoke from the point of view of the man who had spent the whole of his active service—which, unfortunately, was very short—as a pilot. Lighter-than-air craft had the capacity necessary for long journeys, and for such purposes there was nothing to compete with the airship, and there were public duties to be done by aircraft which could not be done by the type of aeroplane we now had.

For especially long journeys a large rigid would be essential. He referred to the kind of thing Col. Heckstall Smith had outlined—exploring in an island like Tasmania. Only one-third of that island had been surveyed. It was unsurveyable by ordinary means, but with a small non-rigid he thought a fair job could be made of it.

Inspectors of agriculture could also survey agricultural land in this country from dirigibles, and in Australia they could be applied to locating wild horses before bringing them in. Some

kind of non-rigid might also be used for air police purposes. He had hoped to hear how the large German rigids got to such extraordinary heights without losing lift, and also that Col. Cave would have told them how H. G. Wells's prophecy about men going inside the gasbags had actually become a fact.

Mr. Gibbon's Plea for All Classes.

Mr. Gibbon said he had been glad to hear several speakers put in a plea for all classes of airships. There were divergent classes required. They all had their functions. Pleas for all classes and peace amongst their family led to good work and tended to that effort, which was what they wanted.

One or two speakers had been disappointed that Col. Cave, with his great knowledge of airship work, had not carried the subject a little further in some points, but he (Mr. Gibbon) had good reason to know that, unfortunately, there was a much-hated person called the Censor, who put certain restrictions on what Col. Cave was willing to disclose and discuss, and he did not want the blame to rest on Col. Cave.

As Col. Heckstall Smith said, the subject was just going to develop, and develop rapidly. If anyone could persuade the financial branch to take a more liberal and just view of the situation, they would do a great and good work.

Room for Every Type.

The Chairman said he would like to associate himself with the remarks of the last one or two speakers. There was room for the rigid, the non-rigid, the aeroplane, and the flying boat in the future for commercial purposes. He thought the airship would do the very long distance oversea routes, and that the aeroplane and seaplane would work on the shorter routes both by land and sea.

There was a great future for all classes, rigids, non-rigids, and aeroplanes, and it was not a question of one or the other. As regarded the Government assistance that would be forthcoming, it was difficult to state to-day what that would be, but the question was being given very careful consideration at the present moment. Some very valuable experiments in mooring out airships, water recovery, and long endurance flights would be carried out by the Government. The Government would probably also supply two of the latest airships—Rigid 33 and 34, which had just been produced—for long endurance flights over the Atlantic. They would probably cross to America in the spring when the weather was suitable. Those ships would not compete for the £10,000 prize offered by the "Daily Mail," but when the time came they would show what airships could do in the way of long endurance flights.

Lt.-Col. Cave-Browne-Cave's Reply.

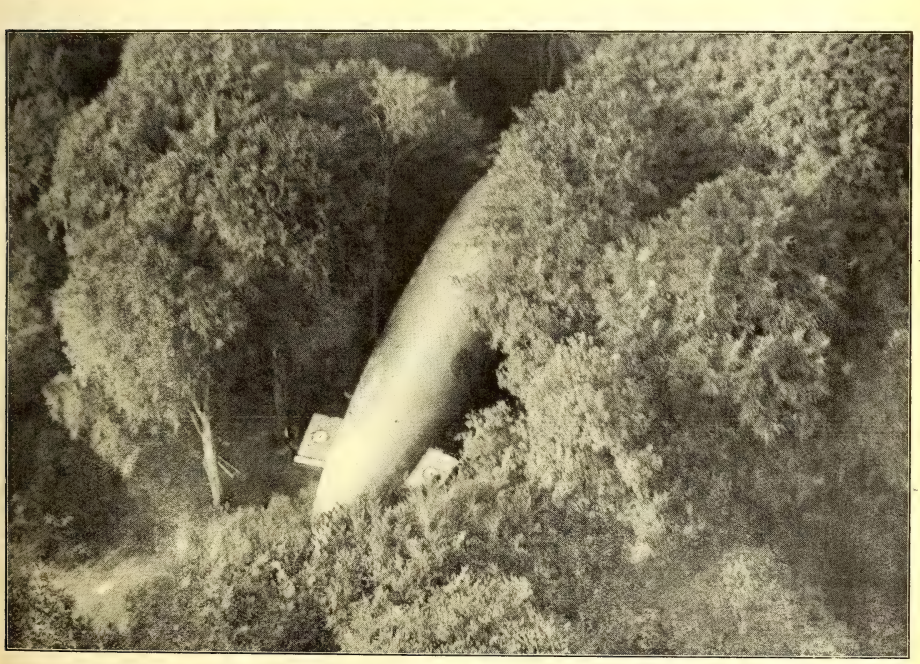
Lt.-Col. Cave-Browne-Cave, replying to the discussion, said he felt very strongly that the development of airships was far from a one-man show. He was extremely glad that a considerable number of those who had been concerned in the developments that had been made were present to see how the Society appreciated their work.

The first two speakers, who dealt with rigid airships, read a totally wrong meaning into the paper. He was perfectly prepared to admit that so far as carrying large loads and travelling long distances at high speeds were concerned the rigid had it absolutely, but for carrying smaller loads shorter distances, and perhaps at smaller speeds, the non-rigid had a large field.

For many naval purposes a non-rigid could be built to fulfil the requirements. The details carried out in the North Sea by German Zeppelins could almost all have been carried out by our own North Sea class.

The Germans started ahead of us in non-rigid construction, but for some reason they dropped it. The question of the non-rigid and the rigid was similar to many engineering questions, such as the Diesel engine and the turbine. As the size of the Diesel increased the mechanical troubles increased, and the turbine was found more suitable for the higher powers. At some horse-powers the turbine became the best prime-mover, but development in the Diesel engine pushed the line of demarcation up, and the turbine pushed it down, and the border line between the two varied as it did in the case of the rigid and non-rigid airships.

His calculations, referred to by Mr. Cole, were based on the lift of 64.5 lbs. per 1,000 cubic feet of hydrogen, which was found to be the average figure in practice. He was glad his critics limited the capacity of the non-rigid to 500,000 and the speed to 50 miles, which were more courageous estimates than he would have made. In reply to Capt. Walpole he said the German airships did lose lift and had to pour water out.



A method of harbouring an Airship in a Wood. This was described in the lecture by Lieut.-Col. Cave-Browne-Cave.

NAVAL & MILITARY AERONAUTICS

FROM THE "LONDON GAZETTE."

War Office, April 30th.

Additional Mentions in Despatches.

France.

The name of the undermentioned officer is to be added to those brought to notice for distinguished and gallant services and devotion to duty by Field-Marshal Sir Douglas Haig, K.T., G.C.B., G.C.V.O., K.C.I.E., Commander-in-Chief of the British Armies in France, in his despatch of November 8th, 1918 :—

Seely, Col. (T./Maj.-Gen.) The Rt. Hon J. E. B., C.B., C.M.G., D.S.O., T.D., M.P.

Air Ministry, April 29th.

R.A.F.—The following temp. appointment is made :—Staff Officer, 2nd Cl. (O).—Capt. A. H. S. Baker, Nov. 18th, 1918.

Flying Branch.—Capt. D. G. Donald to be actg. Maj. whilst empld. as Maj. (A.), April 4th; Capt. G. Donald, D.F.C., to be actg. Maj. whilst empld. as Maj. (A. and S.), from Aug. 30th, 1918, to Feb. 12th (substituted for notification in "Gazette," April 8th).

Lt. L. G. Robinson, M.C., to be actg. Capt. whilst empld. as Capt. (A.), Sept. 1st, 1918.

Lt. (actg. Capt.) E. Burney, M.C., to be Lt. (A.), and relinquishes the actg. rank of Capt., from (S.O.), April 9th.

Sec. Lts. to be Lts. :—F. J. H. Ayscough, Aug. 27th, 1918; G. Kidd, March 28th.

J. J. W. Nelmes (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt. (K.B.), Oct. 30th, 1918; A. R. Turner (Lt., York and Lanc. R., Spec. Res.) is granted a temp. commn. as Sec. Lt. (A.), Sept. 28th, 1918, and to be Hon. Lt. (substituted for notification in "Gazette," Oct. 25th, 1918); 42270 F./Cdt. W. S. Lawson is granted a temp. commn. as Sec. Lt. (A.), Oct. 24th, 1918.

The following relinquish their commns. on ceasing to be empld. :—Lt. (Hon. Maj.) G. H. Howe (Maj., Alb. R.), Feb. 24th; Lt. L. H. Scott (Lt., Can. Eng.), March 16th; Lt. (actg. Capt.) G. E. G. Craig (Capt., Brit. Col. R.), March 17th; Lt. E. L. O'Leary, M.C. (Lt., Can. F.A.), March 18th; Sec. Lt. (Hon. Lt.) T. Pitkethly, M.M. (Lt., Quebec R.), March 20th.

The following are transferred to unempld. list :—Sec. Lt. S. C. Barron, Jan. 17th; Lt. J. Turner, Feb. 4th, Sec. Lt. (Hon. Lt.) J. T. H. Jackson (R.E.), Feb. 6th; Lt. G. H. C. G. Holt, Feb. 12th; Lt. R. Neall, Feb. 13th; Lt. M. A. Fisher-Brown, Lt. (actg. Capt.) J. Oliver, A.F.C., Feb. 14th; Sec. Lt. (Hon. Lt.) W. Duce, Feb. 15th; Sec. Lt. D. C. Bristow, Feb. 16th; Lt. R. A. Burnand, M.C., Feb. 24th; Lt. W. R. Baker, Feb. 25th; Lt. W. G. Barlow, Feb. 26th; Sec. Lt. (Hon. Lt.) R. C. Crook (R.F.A., T.F.), Feb. 28th; Lt. A. A. Baerlein, Sec. Lt. C. A. Newham, March 1st; Sec. Lt. J. Bennie (R. Scots, T.F.), March 4th; Capt. J. C. Liddle, Lt. G. K. Mappin, March 5th; Lt. (Hon. Capt.) W. H. Costello (R.G.A., T.F.), March 7th; Lt. G. M. Brooke, Sec. Lt. A. Berry, March 11th; Sec. Lt. P. W. Bradley, March 14th; Lt. A. G. Burnside, March 16th; Lt. (actg. Capt.) M. A. Newnham, D.F.C., March 18th; Sec. Lt. P. Robertson, March 19th; Lt. A. L. Newell, March 20th; Sec. Lt. (Hon. Lt.) J. M. Brown, Sec. Lt. A. B. Bennett, Sec. Lt. MacA. Bexon, Lt. R. Milner, March 21st; Lt. G. D. Batcup, Lt. V. C. Morris, March 23rd; Maj. A. M. Morison, Lt. S. Spence, March 27th; Lt. J. Sutton, March 28th (substituted for notification in "Gazette," April 4th); Maj. B. Binyon, O.B.E., Lt. R. Beresford (S. Staffs. R.), March 29th; Sec. Lt. L. S. Clarke, Sec. Lt. H. H. B. Newberry, March 30th; Lt. D. M. Murray, Sec. Lt. T. Raines, Sec. Lt. F. H. Turner, March 31st; Lt. T. W. E. Brogden, Lt. (actg. Capt.) H. S. Holman, Capt. R. McN. Keirstead, April 2nd; Lt. G. H. Bastin (substituted for notification in "Gazette," April 18th); Sec. Lt. V. Nutter, Sec. Lt. S. Rawlings (Essex R.), Maj. O. Stewart, M.C., A.F.C. (Middx R.), April 3rd; Lt. W. S. Aulton, Sec. Lt. N. M. Dales, Lt. D. C. Eglinton, M.C., Sec. Lt. A. L. Silverson, Capt. P. Trimlett, April 4th; Sec. Lt. R. M. Atwater, Sec. Lt. A. V. Dearden, Sec. Lt. C. G. Henderson, Sec. Lt. G. K. Hodgetts, Sec. Lt. F. C. Mc-Adams, Lt. (actg. Capt.) D. L. Nutt, Lt. J. H. O'Connell, D.F.C., Sec. Lt. A. M. Taylor, Sec. Lt. C. S. P. Wallace, April 5th; Capt. H. E. Bagot, Lt. R. H. Fenner, Sec. Lt. F. H. Weatherell, April 6th; Sec. Lt. S. J. Bailey, Lt. G. T. Cooke, Lt. G. H. S. Mackenzie, Sec. Lt. B. C. Stubbs, April 7th; Sec. Lt. J. L. Bennett, Lt. J. H. Buttin, Sec. Lt. (Hon. Lt.) F. J. Burton, Sec. Lt. B. H. Clarke, Lt. H. D. Davies, Sec. Lt. (actg. Lt.) W. F. Dollery, D.F.C., Capt. H. G. Hall, Lt. S. T. Lowe, Lt. J. H. Moore, Lt. M. F. Mousley, Lt. G. A. Mountain, Sec. Lt. C. McH. H. Suterland (Gordon Highrs.), Lt. J. O. Simpson, A.F.C., Sec. Lt. F. H. Smoxell, Sec. Lt. H. Vaunstone, Capt. J. R. Walker, April 8th; Sec. Lt. R. L. Bonham, Sec. Lt. G. B. H. Baker, Sec. Lt. A. Bentley, Lt. A. R. Brown, Capt. L. H. Brake, Lt. W. G. M. Browne, Lt. J. Buckley, Sec. Lt. W. Berwick, Sec. Lt. O. H. Brown, Sec. Lt. G. H. A. Cordwent, Sec. Lt. H. St. C. Duncan, Sec. Lt. S. D. Evans, Sec. Lt. C. O. Hinks, Lt. (actg. Capt.) D. R. Mackie, Sec. Lt. (Hon. Lt.) H. A. H. Mould, Lt. F. A. Nethercott, Sec. Lt. G. Norriss, Sec. Lt. V. H. Newton, Sec. Lt. C. Radcliffe, Sec. Lt. H. Rae, Sec. Lt. H. R. F. Richardson, Lt. E. W. Swann, Lt. R. E. Summerfield, Sec. Lt. J. M. Theaker, April 9th; Lt. D. Asserman, Sec. Lt. K. R. Bennie, Sec. Lt. J. W. Brown, Lt. (actg. Capt.) N. S. Beswick, Lt. F. E. Bridges, Lt. A. A. Batchelor, Sec. Lt. S. Coates, Lt. W. English, Sec. Lt. (Hon. Lt.) T. R. Evans, Capt. B. Mews, Sec. Lt. D. Morford, Lt. J. M. J. Moore, M.C., Sec. Lt. R. G. Nicholls, Lt. E. A. Srodniski, April 10th; Sec. Lt. T. Allan, Maj. J. Blackwood, Sec. Lt. C. Beardmore, Lt. (actg. Capt.) O. C. Bridgeman, M.C., Capt. J. L. Carlin, Capt. J. S. Collie, Lt. A. S. Colley, Sec. Lt. A. E. Clark, Lt. (actg. Capt.) H. Fall, D.F.C., Lt. J. W. Greenshields, Lt. R. W. S. Middleton, Sec. Lt. C. E. Millson, Lt. R. Munro, Sec. Lt. G. B. Murray, Lt. B. B. Muckleston, Sec. Lt. L. W. Norman, Lt. S. A. Oudes, M.C., Maj. H. MacD. O'Malley, Sec. Lt. W. A. Robertson, Lt. T. S. Smith, April 11th; Lt. (Hon. Capt.) A. W. Beamand, Lt. J. H. Broadway, M.C., Sec. Lt. J. Cooke, Sec. Lt. A. J. Cunningham, Sec. Lt. H. Chapman, Sec. Lt. E. Dear, Lt. A. S. McGuffie, Sec. Lt. E. Nordberg, Sec. Lt. D. Richmond, Sec. Lt. (actg. Capt.) J. H. Sprott, D.F.C., Lt. U. G. A. Tonge, Sec. Lt. C. O. Thompson, Sec. Lt. J. H. Yalden, April 12th; Capt. F. R. Arthur, Sec. Lt. E. F. Adams, Sec. Lt. K. Ashton, Sec. Lt. R. W. Baker, Sec. Lt. J. B. Bennett, Lt. A. G. Beattie, Sec. Lt. W. H. Brown, Sec. Lt. J. A. T. Bryant, Lt. A. W. Blowes, Sec. Lt. A. J. Brewin, Sec. Lt. C. F. Breckon, Sec. Lt. W. A. Chase, Lt. T. J. Cook, Lt. G. B. Dixon, Sec. Lt. P. Dickens, Sec. Lt. D. McI. Easton, Sec. Lt. R. H. Foss, Lt. E. V. Gibson, Lt. A. W. Gourlet, Lt. R. M. Grice, Lt. R. C. Guest, Lt. H. H. Gatfield, Lt. W. E. Huxtable, Sec. Lt. E. T. Jones, Sec. Lt. R. T. Norton, Sec. Lt. L. F. R. Ollington, Sec. Lt. L. W. Ouellette, Sec. Lt. B. O. Oughton, Sec. Lt. T. J. Ruston, Sec. Lt. C. A. Roxburgh, Lt. W. S. Shaw (W. Rid. R.), Sec. Lt. T. Townson, Sec. Lt. F. B. Whittle, April 13th; Sec. Lt. (Hon. Lt.) L. Brown, Lt. Hon. A. R. Boyle, A.F.C., Sec. Lt. D. L. Brocklesby, A.F.C., Lt. J. L. Bernstein, Capt. H. L. Trydale-Biscol, Lt. J. C. Bateman, Lt. C. S. Bissett, Sec. Lt. J. A. Cogan, Lt. G. A. Forsgate, Lt. E. V. Giles, Lt. W. J. Mussared, Lt. E. Nathan, Lt. M. Newcomb, Lt. H. E. Pettit, Lt. C. B. Stringer, April 14th; Lt. C. Beagle (Manch. R.), Sec. Lt. H. H. Botting, Lt. R. E. Britton, Lt. A. Leslie-Moore, Sec. Lt. C. D. Metcalfe, Capt. J. Mitchell, Sec. Lt. J. A. Monador, Sec. Lt. (Hon. Lt.) E. H. MacManus, Sec. Lt. T. R. Moore, Lt. P. V. Moseley, Sec. Lt. O. M. Murphy, Lt. H. E. R. Nelson, Sec. Lt. F. R. Orriss, Lt. G. O. Smith, Sec. Lt. V. A. Shipman, Sec. Lt. W. V. Thomas, Sec. Lt. R. N. Wellington, April 15th; Sec. Lt. R. Galloway, Capt. (actg. Maj.) J. S. F. Morrison, Sec. Lt. (Hon. Lt.) A. E. Overton, Sec. Lt. C. J. Sear, Lt. C. H. A. Willett, Sec. Lt. J. S. Warry, April 16th; Lt. E. F. Bates, Maj. (actg. Lt.-Col.) J. R. Bedwell, M.C., Sec. Lt. T. R. Bayston, Sec. Lt. A. E. Boggiano, Sec. Lt. H. L. Miller, Lt. G. Rodgers, Sec. Lt. C. Shaw, April 17th; Lt. (Hon. Capt.) R. G. H. Adams, Lt. (Hon. Capt.) L. E. Barry, Sec. Lt. E. A. Baker, Lt. A. Brassington, Capt. (actg. Maj.) J. De Francia, Sec. Lt. F. J. Farr, Sec. Lt. W. J. Gibson, Sec. Lt. H. R. Gomersall, Lt. F. G. S. Musson, Sec. Lt. W. G. Milier, Lt. P. C. Morton, Sec. Lt. B. J. O'Meara, Sec. Lt. A. E. Osborn, Sec. Lt. K. M. Stewart, Lt. J. H. Wallace, April 18th; Sec. Lt. S. J. Bassett, Capt. T. G. G. Bolitho, M.C., D.F.C., Lt. E. Burton, Lt. L. Bertrand, Sec. Lt. H. J. Berry, Sec. Lt. J. D. Barrett, Sec. Lt. L. Bendelow, Sec. Lt. E. Bickley, Lt. C. C. Leslie, Lt. R. F. W. Moore, Sec. Lt. W. J. K. Shirlam, Lt. J. B. Sanderson, April 19th; Lt. (actg. Capt.) W. L. Douglas, M.C., Sec. Lt. J. S. Napper, Sec. Lt. F. Neal, April 20th; Lt. R. W. Birdsall, Sec. Lt. J. W. Brown, Sec. Lt. H. C. Glassford, Lt. B. F. Jackson, Sec. Lt. F. C. Moore, Sec. Lt. J. Oleren-shaw, Sec. Lt. W. Atkinson, April 21st; Sec. Lt. C. J. Armitt, Sec. Lt. W. Y. Bogle, Capt. W. H. Elliott, Sec. Lt. J. Greenwood, April 22nd; Sec. Lt. J. R. Devlin, April 23rd; Capt. D. E. Harkness, April 28th (substituted for notification in "Gazette," Feb. 7th); Sec. Lt. J. Bolton, Sec. Lt. S. Brown, Sec. Lt. (Hon. Lt.) R. Bowman, Sec. Lt. F. R. Chapman, Sec. Lt. W. R. J. Cannon, Sec. Lt. B. R. Cozens, Sec. Lt. S. W. Cobb, Sec. Lt. D. O. Davies, Sec. Lt. K. D MacClure, Lt. P. A. MacDougall, M.C., Sec. Lt. M. P. McCaffrey, April 29th.

Capt. (actg. Maj.) W. G Barker, V.C., D.S.O., M.C., resigns his commn. and is permitted to retain the rank of Maj., April 29th

Capt. W. L. Graham relinquishes his commn. on account of ill-health and is permitted to retain his rank, April 30th; Capt. G. M. Lord Torrington relinquishes his commn., April 30th; Lt. W. V. Greene relinquishes his commn. on account of ill-health and is permitted to retain his rank, April 30th; Sec. Lt. J. McDonald, D.F.C., relinquishes his commn. on account of wounds and is permitted to retain his rank, April 26th; Sec. Lt. C. R. Campbell is antedated in his appointment as Sec. Lt., Flying (A. and S.), April 16th, 1918.

The rank of Maj. (actg. Lt.-Col.) E. D. Horsfall is as now described, and not Maj. as stated in "Gazette," March 28th

The rank of Lt. H. S. Starkey is as now described, and not Sec. Lt. (Hon. Lt.) (actg. Lt.) as stated in "Gazette," April 4th.

The initials of Lt. B. W. Smyth-Pigott are as now described, and not E. W. as stated in "Gazette," April 11th.

The initial of L. Francis is as now described, and not L. E. as stated in "Gazette," March 25th.

The notification in "Gazette," March 28th concerning Lt. S. P. Tarrant is cancelled.

The notification in "Gazette," April 1st, concerning Capt. J. W. Alcock, D.S.C., is cancelled ("Gazette" notice of March 28th to remain).

The notification in "Gazette," April 25th, concerning Capt. W. Taylor is cancelled.

The notification concerning Sec. Lt. R. C. Pattulo in "Gazette," Oct. 8th, 1918, is cancelled.

Administrative Branch.—Lts. (A.) to be Lts. :—J. A. Atkins, R. F. Auerbach, S. P. Briggs, A. H. F. Brothers, G. T. W. Burkett, M.C., L. H. Clemetson, C. P. Creighton, S. L. Empson, W. Hunt, D. W. Paton, D.F.C., T. F. X. Smallwood, J. R. Webb (and to relinquish the actg. rank of Capt.), April 17th.

Lts. (O.) to be Lts. :—N. B. Arbuthnot, W. R. Ashwell, W. S. Aulton, M. Balston, A. N. Burrow, H. C. E. C. P. Dalrymple, C. R. Gross, April 17th.

Lt. W. J. Beach (London R., T.F.) is granted a temp. commn. as Lt., Sept. 13th, 1918.

S. H. Coronel is granted a temp. commn. as Sec. Lt., and to be actg. Lt. whilst specially employed, April 29th.

J. H. Amers is granted a temp. commn. as Sec. Lt., Jan. 22nd.

The following are transferred to the unemployed list :—Sec. Lt. F. A. Needham, Sec. Lt. G. S. Nettleton, Feb. 15th; Capt. (Hon. Maj.) (actg. Lt.-Col.) H. B. Nutting, Feb. 21st; Lt. R. H. New, Feb. 22nd; Lt. W. D. Baird, Feb. 27th; Sec. Lt. H. Entwistle, April 1st; Lt. P. R. Morgan, March 19th; Sec. Lt. G. A. Osborne, March 27th; Maj. W. H. Yeatman-Biggs, March 28th; Lt. H. S. Murdock, March 29th; Sec. Lt. H. S. North, March 31st; Maj. V. C. H. Longstaffe, Sec. Lt. R. F. McQuarrie, Lt. A. L. Underwood, April 1st; Sec. Lt. G. Earl, April 2nd; Sec. Lt. (actg. Lt.) D. M. Brown, Lt. R. R. Edwards, April 3rd; Sec. Lt. N. B. H. Cunningham, April 4th; Capt. J. O. W. G. C. Chambers, Sec. Lt. (actg. Capt.) A. W. B. Medhurst, Sec. Lt. A. W. Todd, April 6th; Sec. Lt. F. C. Catchpole, April 8th; Lt. J. L. Callie, April 10th, Lt. H. S. Cudlip, Sec. Lt. L. M. Miller, Sec. Lt. H. Monkman, April 11th; Sec. Lt. C. F. Pearson, April 12th; Sec. Lt. F. C. Eldred, Sec. Lt. R. L. Gasner, April 13th; Sec. Lt. H. Arnfield, Sec. Lt. (actg. Lt.) F. J. Cutter, Lt. (Hon. Capt.) (actg. Capt.) H. M. Parsons, Sec. Lt. L. R. Robertson, Capt. T. M Wheeler, April 14th; Lt. M. C. Coley, (Norf. R., T.F.), Sec. Lt. W. H. Cant, Lt. A. L. Grant, Sec. Lt. F. E. Rayner, Lt. N. Smith, April 15th; Lt. R. C. Byass, April 18th; Sec. Lt. (actg. Lt.) L. M. Moss, April 19th; Sec. Lt. G. M. Nooman, Sec. Lt. J. C. Stone, April 22nd; Lt. (actg. Capt.) A. E. Neale, April 23rd; Sec. Lt. C. C. Moldram, April 27th; Lt. C. J. R. Milton, April 28th; Lt. J. R. Orrell, April 29th.

Lt. (actg. Capt.) C. G. Darwin is antedated in his appointment as actg. Capt., May 22nd, 1918.

The notification in "Gazette," Feb. 14th, concerning Lt. A. G. Horlock is cancelled.

TECHNICAL BRANCH.—Maj. A. S. Hellawell, O.B.E., to be actg. Lt.-Col. whilst empld. as Lt.-Col., Grade (A), April 1st, 1918.

Capt. P. C. C. Passman to be graded for pay and allowances as Capt. whilst empld. as Capt., Grade (A), June 17th, 1918.

Lt. B. R. Bostock to be actg. Capt. whilst empld. as Capt., Grade (A), April 14th.

Lt. W. K. Manning to be Lt., Grade (B), from (O.), Jan. 13th.

Lt. H. J. Dolan to be graded for pay and allowances as Lt. while empld. as Lt., Grade (B), Sept. 11th, 1918.

Sec. Lt. (Hon. Maj.) R. W. Hodges to be Lt., without pay and allowances of that rank, and to retain his hon. rank, Dec. 1st, 1918.

Sec. Lt. W. Wyatt to be actg. Lt. while empld. as Lt. (Grade A), Sept. 26th, 1918.

Sec. Lt. H. W. Hills to be Sec. Lt., Grade (A.), from (Ad.), March 2nd.

The following are transferred to the unemployed list:—Lt. W. T. Hope-Hawkins, Jan. 24th (substituted for notification in "Gazette" Feb. 14th); Lt. F. W. Nicholson, Feb. 14th; Lt. R. Barnes, Feb. 15th; Lt. (actg. Capt.) H. H. Mitchell, Feb. 22nd; Sec. Lt. H. J. Macready, March 23rd; Capt. A. P. Barry, Sec. Lt. L. R. Merifield, March 26th; Lt. A. E. Bartlett, March 28th; Lt. D. Fredman, Lt. E. H. Nurse, March 30th; Sec. Lt. P. J. Moyes, April 1st; Sec. Lt. C. R. Cunningham, April 2nd; Lt. A. Meyrick, Sec. Lt. J. W. Savage, Sec. Lt. G. A. Tandy, April 3rd; Capt. R. G. Boddie, Sec. Lt. A. W. Coaten, J.P. (actg. Capt.) R. Cook, Lt. R. D. Owen, April 6th; Sec. Lt. C. Roden, April 7th; Capt. (actg. Maj.) H. B. Denton, Sec. Lt. C. R. Evans, Sec. Lt. A. G. Turner, April 8th; Lt. V. W. Allen, Sec. Lt. C. H. Ashworth, Lt. A. E. Fincher-Brookes, Capt. F. C. Starnes, April 9th; Lt. E. C. Fowler, Sec. Lt. A. J. Salmond, April 10th; Lt. J. R. Bedford, Capt. V. A. F. Bellamy, Sec. Lt. F. C. E. Burton, Sec. Lt. (actg. Lt.) H. Chapman, Maj. G. J. Read (North Staffs. R.), April 11th; Sec. Lt. (Hon. Lt.) C. W. Burgess, Sec. Lt. F. A. Carter, Capt. R. P. Champness, Lt. (actg. Capt.) A. H. Edwards, Sec. Lt. J. M. England, Capt. F. P. Gardener, April 12th; Capt. A. F. Bruce, Lt. E. G. Shackell, April 14th; Sec. Lt. E. W. Bell, Lt. R. B. Bond, Sec. Lt. S. L. Boothroyd, Lt. (actg. Capt.) H. W. Brooks, Capt. J. D. Whitelaw, April 14th; Lt. (Hon. Maj.) W. E. Baker, Capt. W. O. Bentley, M.B.E., Sec. Lt. (Hon. Capt.) A. T. Cranmer, Sec. Lt. (Hon. Lt.) R. W. V. Midlane, Capt. (actg. Maj.) L. Newman, O.B.E., April 15th; Capt. J. A. Hagbino, Capt. R. K. D'Arcy, Capt. (actg. Maj.) H. R. Mosenthal, Capt. J. A. Rossi, April 16th; Capt. L. M. Ames, April 17th; Sec. Lt. (Hon. Lt.) A. J. Newling, April 18th; Lt. W. W. Sayer, April 19th; Sec. Lt. (actg. Capt.) W. Burrows, April 20th; Sec. Lt. (actg. Lt.) J. L. Bullimore, Lt. E. C. Deeth, Lt. W. H. G. Furnivall, April 21st; Sec. Lt. J. H. Everett, Sec. Lt. C. W. O'Brien, Capt. J. F. B. Vidal, April 22nd; Lt. W. F. C. Mason, April 23rd; Lt. A. Colledge, April 25th; Lt. W. B. L. Easton, April 29th.

PHYSICAL TRAINING BRANCH.—Capt. R. Northover is transferred to the unemployed list, March 1st.

MEDICAL BRANCH.—Capt. H. R. B. Hull to be actg. Maj., Nov. 18th, 1918 (substituted for notification in "Gazette," April 8th).

Hon. Lt.-Col. G. Dreyer relinquishes his commn. on ceasing to be employed, March 31st.

The following are transferred to unemployed list:—Capt. A. G. H. Moore, March 1st; Capt. W. R. Nasmyth, March 6th; Capt. J. Grimoldby, April 10th.

MEMORANDA.—F. J. Toulmin is granted a temp. hon. commn. as Capt. while specially empld. with the A.I.D., April 18th (substituted for notification which appeared in "Gazette," April 18th).

Temp. Hon. Sec. Lt. (Hon. Capt.) W. G. Adams relinquishes his commn. on ceasing to be employed, March 31st.

The following are transferred to the unemployed list:—Maj. (actg. Lt.-Col.) F. L. Scholte, O.B.E., from (S.O.), Feb. 8th; Sec. Lt. (actg. Capt.) J. L. Brown, Feb. 15th; Maj. G. C. Neilson, from (S.O.) March 1st; Capt. (actg. Maj.) N. D. Newall, O.B.E., from (S.O.), March 15th; Capt. (actg. Maj.) C. G. Beatson, from (S.O.), Maj. R. E. Nicoll, from (S.O.), March 31st; Capt. W. Astell, from (S.O.), April 2nd; Maj. J. W. K. Allsop, from (S.O.), April 11th; Maj. H. K. Maxwell, from (S.O.), April 15th; Lt. (actg. Capt.) A. J. Clark, from (S.O.), Lt. (actg. Maj.) C. A. Mercer, from (S.O.), Capt. R. E. Ollerenshaw, from (S.O.), April 16th.

Maj. (actg. Col.) E. G. Mackenzie relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain the rank of Col., April 30th.

The rank of Lt. (actg. Capt.) H. B. Langton (R.G.A.) is as now described, and not Sec. Lt. (actg. Capt.), as stated in "Gazette," Feb. 18th.

AIR MINISTRY, May 2nd.

R.A.F.—The following temporary appointment is made:—Graded for pay at Air Ministry rates, Staff Officer, 1st Cl. (Air.).—Lt.-Col. R. P. Ross, D.S.O., April 1st.

FLYING BRANCH.—Lt. (actg. Capt.) S. C. Iron is confirmed in his rank of Capt., May 2nd; Lt. G. H. Clifford to be Lt., from (Ad.), Sept. 3rd, 1918.

Sec. Lts. to be Lts.:—(Hon. Lt.) H. Sainsbury, April 13th, 1918; (Hon. Lt.) E. A. Collis, May 28th, 1918; W. G. Millar, July 30th, 1918; A. MacArthur, Dec. 27th, 1918.

P.F.O. H. E. Hudson (late R.N.A.S.) is granted a temp. commn. as Sec. Lt. (A. and S.), June 9th, 1918 (since killed).

Sec. Lt. F. Workman (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt. Observer Officer, Sept. 13th, 1918.

The following relinquish their commns. on ceasing to be empld.:—Lt.-Col. C. J. L'Estrange Malone, O.B.E. (Lt., Royal Navy), Dec. 28th, 1918; Lt. C. Osenton, A.F.C. (Lt., B. Col. R.), Feb. 6th; Lt. T. M. Kerruish (Lt., Manitoba R.), March 3rd; Sec. Lt. (Hon. Lt.) F. G. Gardiner (Lt., C. Inf. R.), Lt. J. E. Wood (Lt., Brit. Col. R.), March 16th; Sec. Lt. (Hon. Lt.) O. M. Martin (Lt., Manitoba R.), April 1st.

The following are transferred to unempld. list:—Sec. Lt. (Hon. Lt.) R. M. Fletcher, Jan. 9th; Lt. (Hon. Capt.) G. H. Simpson, Jan. 24th (substituted for notification in "Gazette," Feb. 20th); Sec. Lt. (Hon. Lt.) A. L. Bowman, Jan. 30th; Lt. F. Thompson, Feb. 3rd; Maj. B. F. Fowler, Feb. 10th; Sec. Lt. T. J. Calnan, Sec. Lt. F. L. Scott, Feb. 12th; Sec. Lt. W. H. McLauchlan, Feb. 13th; Sec. Lt. P. C. S. McCrea, Feb. 18th; Sec. Lt. W. F. Deeks, Feb. 20th; Lt. W. L. Hope, Feb. 22nd; Lt. R. W. Goodwin, Sec. Lt. G. W. Taylor, Feb. 23rd; Capt. N. Crompton, Feb. 27th; Lt. D. J. Teepoorten, Feb. 28th; Capt. J. V. Sorsoleil, M.C., Sec. Lt. P. R. Tingley, March 12th; Sec. Lt. H. Andrews, March 21st; Capt. R. B. Freeland, March 22nd; Sec. Lt. A. S. Withers, March 23rd; Lt. (actg. Capt.) J. W. L. Birkbeck, Sec. Lt. D. G. Hood, Sec. Lt. J. C. Kyle, March 28th; Lt. S. W. Briggs, Sec. Lt. A. Harvey, March 29th; Capt. (actg. Maj.) T. D. Beck, Lt. R.F.A., T.F.), Lt. A. G. Edwards Lt. (Hon. Capt.) (actg. Capt.) L. S. Ladd, Capt. A. C. Sharwood (substituted for notification in "Gazette," April 4th), March 30th; Lt. J. G. Hay, Capt. A. A. N. Haywood, Lt. H. R. Hutt, March 31st; Lt. (actg. Maj.) D. L. Blumenfield, Sec. Lt. J. S. Hasdell, Lt. L. C. Janett, Sec. Lt. R. W. Lewin, April 1st; Sec. Lt. M. C. Fraser, Lt. G. N. Goldie, April 2nd; Sec. Lt. J. K. Holdsworth, Lt. J. G. Hunter, Sec. Lt. J. E. Lamb, Capt. (actg. Maj.) M. Lyon, April 3rd; Sec. Lt. H. J. Bradley, Capt. C. R. Cook, Sec. Lt. L. C. Filby, April 4th; Sec. Lt. J. R. Heming, Sec. Lt. (Hon. Lt.) A. Powell, April 5th; Lt. (actg. Capt.) H. D. Crompton, Sec. Lt. A. P. Knightbridge, April 6th; Sec. Lt. C. A. Hopkins, Lt. G. F. E. Harrison, Lt. H. L. Jones, Maj. J. C. P. Wood, April 7th; Capt. N. H. Dimmock, Sec. Lt. F. W. Haserick, Sec. Lt. G. E. Whitcomb, April 8th; Capt. S. Dalrymple, Lt. W. C. G. Geraghty, Sec. Lt. J. H. Holley, Lt. E. C. Kinghorn, Sec. Lt. F. L. Kirby, Sec. Lt. R. J. Lester, Capt. G. B. Robotham, D.F.C. (Notts and Derby R.), April 9th; Lt. P. C. Foster, Sec. Lt. J. Huson, Sec. Lt. H. S. S. McGill, Sec. Lt. H. Mitchell, Lt. C. G. Thomson, Sec. Lt. H. E. Whiteman, April 10th; Sec. Lt. W. G. Duncombe, Sec. Lt. J. Haigh, Sec. Lt. O. R. Hibbert, Lt. A. R. Milne-Henderson, Sec. Lt. R. C. Hunter, Sec. Lt. R. G. De Little, Sec. Lt. H. E. London, April 11th; Sec. Lt. D. C. Anderson, Sec. Lt. P. H. Bridges, Sec. Lt. (Hon. Lt.) S. R. Grover, Sec. Lt. C. W. Neill, Sec. Lt. O. C. Roberts, Sec. Lt. F. G. Smith, April 12th; Capt. W. L. Anderson, D.S.C., Sec. Lt. W. S. Broad, Sec. Lt. N. W. Churchill (substituted for notification in "Gazette," March 7th); Lt. (actg. Capt.) D. Dalgleish, Lt. E. M. Francis, Sec. Lt. K. L. Graham, Sec. Lt. M. E. Hall, Sec. Lt. H. A. Hinsperger, Sec. Lt. M. J. Hendrickson, Sec. Lt. W. H. Herold, Sec. Lt. C. S. Jefferson, Sec. Lt. A. G. Kettles, Sec. Lt. N. H. Kilpatrick, Lt. F. I. Livingstone, Sec. Lt. G. M. Marshall, Lt. N. Middlebrook (Rif. Brig.), Sec. Lt. W. N. Nicholson, Lt. G. L. Platts, Lt. S. A. Purvis (Scot. Horse Yeo., T.F.), Lt. D. G. Reid, Sec. Lt. P. Smye, Lt. H. C. Stanyon, Sec. Lt. H. T. W. Sutherland, Sec. Lt. H. J. Shields, Sec. Lt. T. Swan, Lt. B. K. Sleightholme, Sec. Lt. G. Slater, Sec. Lt. H. H. Street, Sec. Lt. T. A. Sephton, Sec. Lieut. G. R. Toms, Sec. Lieut. G. W. Tisdale, April 13th; Sec. Lt. G. R. Bradley, Sec. Lt. (Hon. Lt.) E. H. Bennett, Sec. Lt. J. L. Custard, Sec. Lt. H. E. Cutler, Lt. C. E. G. Gill, Sec. Lt. W. Waddingham, Lt. L. A. Westcott, April 14th; Sec. Lt. A. G. Braham, Sec. Lt. W. K. Cole, Lt. K. E. Caldicott, Sec. Lt. W. C. V. Fowler, Lt. W. B. Giles, Lt. L. T. Hockley, Sec. Lt. C. B. Joy, Sec. Lt. K. P. Kirkwood, Sec. Lt. G. Lagerfeld, Sec. Lt. H. G. Liggett-Bell, Sec. Lt. A. W. Lowry, Lt. A. McKean, Sec. Lt. W. A. McLeod, Sec. Lt. E. O. W. Matthews, Sec. Lt. D. G. Scovil, Sec. Lt. G. F. Sponenburg, Lt. T. B. Service, Sec. Lt. D. L. Thorburn, Sec. Lt. F. E. Vernon, April 15th; Sec. Lt. T. B. Alexander, Sec. Lt. G. E. Brooks, Lt. C. J. Clark, Lt. A. L. Clow, Lt. A. L. Challis, Sec. Lt. C. G. Knowles, Lt. G. Osborn (Scot. Horse Yeo., T.F.), Lt. G. J. R. Potter (R.F.A., T.F.), Sec. Lt. W. G. Smith, Sec. Lt. W. Tinsley (Lond. R., T.F.), Sec. Lt. G. S. Thomas, Lt. F. W. Verry, April 16th; Sec. Lt. S. Barker, Sec. Lt. A. J. Bridge, Sec. Lt. S. Burn, Sec. Lt. A. Barrington, Sec. Lt. J. Bevan, Lt. R. A. Birch, Lt. A. H. Dempster, Capt. H. D. Harman, M.C., Sec. Lt. R. J. B. S. Stuart, April 17th; Sec. Lt. F. C. Andrews, Sec. Lt. J. C. Barns, Lt. L. A. Colbert, Sec. Lt. R. F. Daglish, Sec. Lt. E. Fearnside, Lt. (actg. Capt.) F. Hyde, M.C., Sec. Lt. L. E. F. Paxton, April 18th; Capt. (actg. Maj.) G. M. Croil, April 20th; Sec. Lt. W. J. Bocking, Sec. Lt. S. A. Dismore, Lt. F. H. Lear (R. War. R., T.F.), Sec. Lt. H. B. A. O'Mara, April 21st; Lt. R. P. Brailli, Capt. A. W. Kay, April 22nd; Sec. Lt. R. G. Carr, April 23rd; Sec. Lt. W. Fitzpatrick, Sec. Lt. A. E. Hole, Sec. Lt. F. R. James, Sec. Lt. H. S. Marfleet, April 29th; Sec. Lt. F. W. Fryer, April 30th.

Capt. B. A. Millard relinquishes his commn. on account of ill-health contracted on active service and is permitted to retain his rank, May 3rd.

Lt. (Hon. Capt.) H. M. Rusworth (Lond., R.) relinquishes his commn. on account of ill-health, May 3rd (substituted for notification in "Gazette," March 15th).

The following Sec. Lts. relinquish their commns. on account of ill-health and are permitted to retain their rank:—C. T. Cunningham, April 13th (substituted for notification in "Gazette," March 21st); D. F. Tysoe (caused by wounds), S. Pile, May 3rd.

The following Sec. Lts. resign their commns.:—R. Mantegazza, G. McHardy, May 3rd.

Sec. Lt. D. G. Story to take rank and prec. as if his appointment as Sec. Lt. bore date Oct. 1st, 1918.

The surname of Sec. Lt. W. G. Duncombe is as now described, and not as stated in "Gazette," Nov. 8th, 1918.

The Christian names of Lt. F. H. Berry are as now described, and not as stated in "Gazette," March 11th.

The surname of Lt. R. B. B. Siever, M.C., is as now described, and not Sovier as stated in "Gazette," March 21st.

The surname of Sec. Lt. E. J. Norris is as now described, and not Morris as stated in "Gazette," March 21st.

The notification in "Gazette," April 1st concerning Lt. M. P. Lafleur is cancelled.

The notification in "Gazette," Jan 17th concerning Lt. A. G. Bewes is cancelled (notification in "Gazette," Feb. 7th to remain).

ADMINISTRATIVE BRANCH.—Sec. Lt. (actg. Maj.) C. A. E. Lloyd to be Lt., and to retain his actg. rank, April 2nd, 1918.

Lt. (actg. Capt.) B. Turner retains the actg. rank of Capt. while empld. as Chemical Warfare and Explosive Expl. Officer, from March 20th to April 30th.

Sec. Lt. A. H. Hasler to be actg. Capt. while empld. as Capt., Nov. 15th, 1918 (substituted for notification in "Gazette," Sept. 11th, 1918).

Lts. (A.) to be Lts.:—H. S. Brackenbury, N. S. Caridia, C. H. Clifford, R. C. Day, C. F. Embleton, F. Green, N. A. Holmes, E. Hillary, P. N. Hoyle, H. H. Jones, G. Knight, R. C. F. Nailer, H. M. Paterson, H. F. Proctor, G. H. Raitt, G. Scarrett, H. B. Turner, F. H. Watts, R. Waugh, April 17th.

Capt. C. H. W. Godfrey to be Lt., from (A'ship), April 17th.

Lt. T. H. J. Wright to be Lt., from (K.B.), April 17th.

Lts. (O.) to be Lts.:—L. J. S. Dowland, A. H. Lancaster, A. N. Nesbitt, A. D. Tatham, April 17th.

J. G. Haslan (T/Lt. and Qrmr.) is granted a temp. commn. as Lt., April 1st, 1918.

Lt. T. J. Southern (Yorks Hrs.) is granted a temp. commn. as Lt., April 17th, seny April 1st, 1918.

Sec. Lts. to be Lts.:—H. F. Phillips, May 4th, 1918; S. A. Gordon, Nov. 31st, 1918.

Sec. Lts. to be Sec. Lts., from (A.):—R. Cookson, E. T. A. Keitzman, M. H. McRae, April 17th.

Sec. Lts. to be Sec. Lts., from (A. and S.):—P. Rabinson, P. R. Cook (and to be Hon. Lt.), April 17th.

Sec. Lts. to be Sec. Lts., from (O.):—H. H. Creighton, T. A. Chilcott, W. S. Hedley, J. B. Russell, D.F.C., April 17th.

Sec. Lt. C. G. F. Cauver to be Sec. Lt., from (K.B.), April 17th.

The following Sec. Lts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lts.:—W. D. Tye, C. E. Briant, H. C. Bird, March 31st.

The following relinquish their commns. on ceasing to be empld.:—Lt. E. D. Whittles (Lt., R. War R.), July 13th, 1918; Lt. C. L. Hancock (Lt., Leicester R.), Nov. 24th, 1918.

The following are transferred to unempld. list:—Sec. Lt. R. E. Denton, Sec. Lt. H. W. F. Long, Feb. 18th; Capt. A. C. Osman, Feb. 21st; Sec. Lt. W. Bull, March 16th; Lt. (Hon. Capt.) (actg. Capt.) J. D. Lyons, March 31st; Lt. J. F. Gibson, Lt. H. W. Hamer, April 4th; Lt. T. W. Hill (R.F.A.), April 7th; Lt. M. Walker, April 8th; Sec. Lt. A. G. Masters, Sec. Lt. H. E. Rubie, April 11th; Sec. Lt. G. F. Layne, April 12th; Lt. S. T. Stephens, Sec. Lt. H. E. Snyder, April 17th; Lt. (Hon. Capt.) (actg. Capt.) C. W. Banks, April 14th; Sec. Lt. C. L. Pinker, April 15th; Lt. A. J. Williamson, April 16th; Capt. W. B. Bryans, Sec. Lt. J. L. Beattie, Capt. S. Watters, April 18th; Lt. (Hon. Capt.) D. F. Loftus, April 19th; Sec. Lt. M. W. Boot, April 20th; Lt. D. B. Brayshaw, April 24th; Lt. K. Mackenzie, April 30th.

Maj. R. H. Ferguson is removed from the R.A.F., April 30th.

Capt. (actg. Maj.) H. W. Morgan (Capt., R.K. Rif. C.) relinquishes his commn. on account of ill-health contracted on active service, May 3rd.

Sec. Lt. F. A. Crowe resigns his commn., May 3rd.

The rank of Lt. (actg. Capt.) G. C. Bateman is as now described, and not as stated in "Gazette," April 15th.

The date of appointment of Sec. Lt. C. W. Whitworth is Sept. 1st, 1918, and not Sept. 2nd as stated in "Gazette," Sept. 6th, 1918.

The notification in "Gazette," April 1st concerning Sec. Lt. A. H. Jarman is cancelled.

The notification in "Gazette," April 1st concerning Sec Lt F. W. R. Johnson is cancelled.

The notification in "Gazette," Feb. 25th concerning Lt. (Hon. Capt.) G. H. Simpson is cancelled.

TECHNICAL BRANCH.—Sec. Lt. (actg. Lt.) W. W. Hammond to be actg. Capt. whilst empld., as Capt., Grade (A), Nov. 1st, 1918 (substituted for notification in "Gazette," Feb. 25th and March 14th).

Lt. H. V. Harle to be Lt., Grade (A), from (Ad.), Dec 15th, 1918.

Lt. T. W. Cave, M.C., to be Lt., Grade (B), from (O), April 17th.

Sec. Lts. to be Lts., without pay and allowances of that rank :—(Hon. Lt.) T. McC. Yarwood, April 2nd, 1918; T. H. Sills, April 19th.

Sec. Lts. to be Sec. Lts., Grade (B), from (Ad.) :—H. T. Miles, Oct. 1st, 1918; Sec. Lt S. W. Banfield, Oct. 30th, 1918; F. T. Harris March 24th.

Maj. T. O. H. Lees (Maj., R.M.L. Inf) relinquishes his commn. on ceasing to be empld, April 7th.

Transferred to unempld. list :—Sec. Lt (Hon. Lt.) K. Cornthwaite (Dorset R.), Feb. 25th; Maj. F. R. E. Davis, O.B.E., March 4th; Capt. M. P. Bousfield, March 15th; Capt. C. S. Boston, Capt. F. L. Bristow, March 28th; Capt. R. L. Charteris, March 20th; Maj. (actg. Lt.-Col.) R. Holloway, March 31st; Lt. H. H. Hussey, April 2nd; Lt. J. F. Adye, Maj. the Hon. M. Egerton, April 3rd; Capt. E. E. Haywood, April 6th; Sec. Lt. C. S. Hill, April 8th; Sec. Lt. A. E. Ainsworth, Sec Lt. C. A. Wilkin, April 9th; Sec. Lt. C. F. Scholefield, April 11th; Lt. S. M. Barrett, Capt. S. McLaughlin, Sec Lt. W. Pollard, Sec Lt. H. D. Torres, April 12th; Sec. Lt. W. W. Grant, Sec. Lt. H. Hall, April 13th; Sec. Lt. J. E. Cade, April 14th; Sec. Lt. (actg. Lt.) S. J. Fountain, Lt. D. McI. Mitchell, April 15th; Sec. Lt. J. Crosbie, April 16th; Sec. Lt. F. B. Palmer, M.C., April 17th; Sec. Lt. I. Bawden, Sec. Lt. R. W. Letchford, April 21st.

The surname of Capt. (Hon. Maj.) W. R. G. Atkins is as now described, and not Atkinson as stated in "Gazette," of March 21st.

The rank of Lt. (actg. Capt.) A. R. B. Gill is as now described, and not Lt. as stated in "Gazette," April 15th.

The notification in "Gazette," March 11th, concerning Maj. F. R. E. Davies, O.B.E., is cancelled.

The notification in "Gazette," March 28th, concerning Maj. F. R. E. Davies, O.B.E., is cancelled.

The notification in "Gazette," Dec 17th, 1918, concerning Lt. H. Stansfield is cancelled.

MOTOR BOAT BRANCH.—Capt. E. D. H. Robinson is transferred to unempld list, April 18th.

MEDICAL BRANCH.—P. C. Livinston is granted a temp. commn. as Capt., May 1st.

Transferred to unempld. list :—Capt. A. L. George, April 8th; Capt A. G. Holman, April 9th; Lt. H. G. James, April 11th.

Capt. M. E. H. Neale relinquishes his commn. on account of ill-health and is permitted to retain his rank, May 3rd.

MEMORANDA.—J. S. T. Bradley (Maj., M.G.C.) is granted a temp. commn. as Maj., and to be temp Lt.-Col. whilst specially empld., Aug. 1st, 1918 (substituted for notification in "Gazette," Oct. 4th, 1918).

The following Overseas Cadets are granted temp. commns. as Sec. Lts., 316810 F. W. Anderson, 316811 N. A. Avery, 316797 W. H. Brown, 179573 W. D. Brown, 184186 A. A. Boon, 316796 A. Brandon, 179686 W. H. B. Buckharst, 182766 G. Carter, 184605 F. M. Clarke, 182587 W. G. Coull, 182598 S. A. Claghan, 316798 G. H. Christensen, 316818 F. S. Collier, 183586 M. W. Curtis, 316787 G. P. Deal, 316819 W. M. Elliott, 316944 E. H. Flowers, 182589 F. J. A. Fulton, 182592 S. Gallachan, 179984 A. V. Gladstone, 316802 D. C. Godfrey, 182594 R. M. D. Hall, 182593 C. D Handley, 180272 H. A. Hamilton, 316814 F. C. Harris, 317820 S. G. Hay, 316822 L. R. Henrys, 316821 B. J. Hair, 316823 L. B. Harris, 316812 J. R. Johnston, 182598 A. H. Keene, 316809 K. Kissling, 26849 J. Larkin, 316840 W. Littlejohn, 316824 W. T. Luxton, 110863 A. E. Matthews, 182599 M. A. Manhire, 184345 L. E. Maher, 179763 W. S. A. Mills, 316826 H. I. N. Melville, 316827 L. Myers, 316828 W. R. Mawdsley, 182602 D. Mc-Arthur, 684476 J. E. McCarthy, 182601 A. E. W. McDonald, 316815 R. G. MacDonald, 316828 J. E. McDiarmid, 316501 I. A. McGregor, 316804 W. T. McKeague, 184636 J. Oliver, 316717 J. Parr, 184128 R. R. Parsons, 181866 M. J. Plaistowe, 316806 A. D. Poulton, 316805 C. W. Preece, 181039 A. S. Pursell, 179495 O. Richards, 182604 J. A. O. Ritchie, 316829 J. R. Richardson, 316830 W. G. Ross, 316807 E. Roe, 181789 E. L. Rose, 184642 T. K. Russell, 316833 K. Simpson, 316831 L. W. Stewart, 184130 L. H. Stewart, 184644 E. N. H. Stewart, 184129 H. A. Stark, 316834 C. H. Taylor, 180310 A. F. Tasker, 35277 P. A. Turner, 316834 J. A. Taylor, 182606 N. E. Vale, 316836 R. J. Walker, 316837 G. G. N. White, 316809 R. J. M. Webber, 316789 O. Warnock, 316840 D. Winegfield, 176841 C. Wildsmith, 184131 W. W. Withnell, 156582 S. A. Wilcox, 12939 J. P. Wilson, 316567 R. W. B. Young, 117855 E. W. Abrams, 176452 M. Adams, 182145 T. R. Abbott, 132886 E. Adendorff, 183851 F. L. Ashley, 182126 P. J. Atkinson, 182127 H. W. Atkinson, 183576 T. Andrews, 181902 J. R. Aird, 176451 J. Ashfield, 181874 J. E. Anderson, 181852 R. W. Annan, 6066 F. J. Allan, 184494 R. Anderson, 179699 P. R. Alston-Hole, 184738 C. Ardrew, 2656 N. C. Archibald, 184245 G. L. R. Aspeling, 270415 D. M. Adlam, 27011 D. Aylam, 177136 W. B. C. Alderman, 442 H. A. Anderson, 184246. J. Aylff, 12509 C. Anderson, 1277 L. H. Austin, 316576 H. V. Balden, 182398 V. C. Berrange, 182128 A. F. Bowan, 181856 G. W. Breakspeare, 182148 T. T. Bielski, 181852 G. C. Botts, 181497 H. J. Boullic, 181882 D. D. Bradfield, 184250 R. D. Bryce, 182281 V. Brown-Dennison, 182550 E. Bone, 178144 W. S. Bain, 181864 R. T. Barr, 178295, J. Burrus, 181854 I. M. Bassett, 182146 G. Borthwick, 176566 J. V. Bolton, 184209 F. Becker, 182833 A. V. Bramwell, 316838 R. Brooks, 185248 F. Basson, 182311 B. G. R. Baxter, 184496 R. C. Brien, 176453 T. W. Brien, 182260 A. H. Brooke, 184742 D. B. Barbour, 182473 C. F. Baker, 61213 R. T. Beynon, 5320 A. Ballantyne, 435 P. W. Brown, 182147 W. A. R. Botha, 182226 J. D. Blomerus, 181877 D. E. Brereton, 176455 V. Beaumont, 184495 V. P. M. Berry, 181047 I. Bothwell, 182172 H. Blair, 181117 H. R. Burt, 178146 J. D. Boyd, 7616 C. D. E. Braine, 2350 D. R. H. Brown-Bon, 184792 F. J. Boogh, 7418 F. V. Beecham, 172 D. H. Baldwin, 316719 F. D. Blackmore, 184249 C. A. Blackburn, 184496 R. C. Bryan, 181152 M. P. Croxford, 182170 T. Caister, 181879 G. Clough, 182143 W. J. Callachan, 182283. W. E. Casey 184499 F. P. Christie, 137995 H. Coen, 183852 T. M. Churcher, 183856 M. C. Coombs, 181878 R. S. Cowie, 182251 P. E. Chandley, 170716 H. S. Cross, 182132 E. C. Cross, 184252 N. Cannikin, 182284 G. Chaplin, 182227 A. N. Copland, 183857 R. Cumming, 176462 M. C. Cooper, 182170 A. Connock, 184233 R. C. Cunliffe, 175463; F. R. A. Chappe, 181863 R. H. Cooper, 182285 J. H. E. Clark, 179718 V. H. Collins, 184498 D. N. Cheshire, 137923 J. Coughlan, 181298 D. T. Cockrane, 335 H. J. Chandler, 184210 R. H. Collett, 1151 H. Canard, 182151 C. G. A. Cory, 178155 P. M. Curtis, 982 F. C. Creed, 166 H. W. A. Cooper, 128976 D. Campbell, 316580 M. N. Clark, 176509 P. de Beyer, 176471 C. R. Dryer, 181880 J. F. du Toit, 316584 R. A. Douglas, 181858 A. J. E. de Smidt, 182186 J. C. Donohoe, 182008 H. S. Downham, 184500 E. E. Durham, 183600 H. E. De Smidt, 182141 H. W. Donoban, 182240 J. H. Densham, 182154 O. B. Duckles, 182206 H. A. Davies, 182259 P. L. Drost, 182157 W. A. Dawson, 182155 R. E. Dick, 137959 V. R. Day, 182156 J. A. Dalziel, 183605 J. H. Deenik, 183879 W. T. Dowie, 181859 E. J. Davis, 2911 G Ducie, 182241 J. F Dykman, 181860 J. H. Darroll, 180024 B. B. Davis, 316592 F. C. Dalley, 182286, J. B. Davis, 182229 E. Earl, 184501 J. L. Edwards, 182275 D. Erasmus, 176472 A. H. Elton, 184502 D. C. Eaton, 181869 D. Edwards, 182208 E. G. Egling, 176480 R. G. Elliott-Troy, 176514 C. C. Elliott, 182274 P. H. B. Everett, 182142 A. Egan, 183858 C. S. Erswell, 184255 V. R. Estment, 1662 A. Edwards, 316793 C. W. S. Fisher, 182139 A. W. Freemantle, 184256 L. W. Frewen, 182158 F. W. Fraser, 182241 C. Ferraris, 176518 G. P. Faul, 183880 R. W. Fairall, 182187 H. J. Field, 182173 E. F. Frances, 184503 R. K. Fletcher, 170521 C. R. Fletcher, 176920 D. V. Fiddien-Green, 184257 W. Fowler, 182138 S. A. Fish, 137961 A. J. Fraser, 184506 C. E. Fincham, 176567 L. C. Flanders, 184509 R. Fisher, 1308 W. N. Frames, 104521 E. H. Field, 184511 V. R. Gordon, 179474 W. A. Geard, 181891 E. A. Geraghty, 181871 A. S. Gray, 182288 F. D. Grant, 184507 R. B. Garland, 184508 I. P. Grey, 182161 J. D. A. Green, 182230 J. L. Gillispie, 182513 C. V. Groom, 184258 R. F. Gainsford, 182100 E. C. C. Gedye, 182174 V. C. Gibson, 182189 J. R. Gibson, 176523 C. D Gowing, 182209 S. F. Grinstead, 182243 J. B. Grant, 184512 D. Gottlieb, 184509 R. Gilbert, 181862 R. A. Graham, 176531 J. M. Green, 182242 C. J. R. Gunning, 184259 E. B. Gill, 182188 A. Gammie, 184510 A. C. Gowlett, 4738 R. C Greener, 73835 A. L. Gordon, 184419 G. Geddes, 316595 W. F. N. Harward, 180828 A. G. Huntley, 184490 E. A. Harlow, 184263 F. J. Hellier, 182211 L. W. Hurd, 182162 C. E. Hill, 181841 V. R. Henman, 182245 J. C. Hurry, 184514 M. C. Hamm, 17051 A. V. Hassall, 182190 C. Hill, 184518 S. W. Hartwell, 184519 R. A. Hesom, 184260 H. Halkney, 183861 W. N. Hallett, 184261 G. C. Hangar, 182246 W. B. Hendry, 181872 S. Heard, 182090 N. R. Hooper, 182125 O. L. Harvey, 183862 A. P. Horak, 184262 C. Hill, 183860 J. G. Hoal, 170543 J. B. D. Herbert, 182210 H. W. Hart, 184520 E. J. Hurry, 182315 H. H. Hughes, 182289 S. D. Holmes, 183882 G. L. Handley, 100901 T. H. Houghton, 176895 E. Hodgson, 184515 E. C. Hale, 184481 V. F. Hall, 184793 P. E. B. Holliwell, 184516, S. R. Harrison, 184517 J. W. Hastie, 178175 W. H. Hudson, 182247 D. Hamilton, 170541 W. J. Hodson, 184308 G. L. Ingham, 182089 J. G. Jacobs, 183883 F. Judd, 182210 H. Jones, 184522 S. H. Jones, 184523 G. L. Jobling, 32040 J. S. Jolliffe, 180042 W. A. Kirsten, 182213 G. O. Kelly, 182260 V. Kenmuir, 182135 C. A. Kelsey-Harvey, 182232 J. King, 184265 V. O. C. King, 182531 A. E. Klernander, 182231 J. H. Kennedy, 181948 J. Kluc, 182243 A. J. Kulling, 182248 H. D. Kenmuir, 1586 B. T. Koch, 183885 C. L. Lamb, 183834 N. Le Roux, 184491 A. Law, 184435 W. Laurie, 182193 L. L. Lavin, 182153 L. Larkin, 182233 T. Lockyer, 182112 N. J. Latz, 182234 A W Leitch, 182201 H. Lumsden, 184526 C. J. Laver, 182192 J. Lister, 182110 G. Leeson, 184527 J. Lowe, 182111 A. Lloyd, 184528 J. Love, 182263 L. C. Lawson, 9201 C. G. Lawrie, 181816 A. W. Lewis, Feb. 15th.

Capt. W. Bean, D.S.O., D.S.C., relinquishes his commn. on being elected M.P. Dec. 28th, 1918.

Temp. Hon. Capt. J. E. Valentine relinquishes his commn. on ceasing to be empld., Feb. 16th.

Capt. J. P. Cherry (Dur. L.I.) relinquishes his commn. on ceasing to be empld., March 15th.

Transferred to unemployed list :—Capt. D. L. Cox, from (S.O.), Jan. 31st; Capt. (actg. Maj.) A. D. Pearce, from (S.O.), March 29th; Maj. G. D. Pryor, from (S.O.), April 7th; Capt. L. E. Lander, from (S.O.), April 8th; Capt. (actg. Maj.) P. Laing, from (S.O.), April 12th; Capt. R. A. B. Orlebar, from (S.O.), April 15th.

Notification in "Gazette," Sept. 10th, 1918, concerning Sec Lt (Hon. Lt.) A. Ward is cancelled.

FROM THE COURT CIRCULAR.

WINDSOR CASTLE, May 3rd.

The King witnessed the triumphal march of the Dominion troops past Buckingham Palace this afternoon.

In attendance upon his Majesty was the Right Hon. Winston Spencer Churchill, M.P., Secretary of State for War and Air.

ADMIRALTY APPOINTMENTS.

The following appointments have been made :—

May 1st.—Lieut.-Commr. A. I. Powell to "Argus" (April 20th)

Bosns.—S. Austin to "Argus" (April 30th).

May 5th.—R.N.R.—Mids. (temp.) St. J. A. D. Garniss to "Argus" (May 3rd).

PERSONAL NOTICES.

NAVAL.

MARRIAGE.

STEPHENS—FINN.—On April 26th, at St. Matthias' Church, Richmond, Surrey, Capt. Maurice Hugh Stephens, R.A.F. (late R.N.A.S.), was married to Marjorie Isabel, younger daughter of the late Alexander Finn and Mrs. Finn, of 2, Park Road, Richmond, Surrey, by the Rev. H. D. L. Viener, Captain-in-Chief, R.A.F., assisted by the Rev. B. Harvey.

MILITARY.

DEATH.

GRIMWOOD.—Bertie C. R. Grimwood, R.F.A., attd. R.F.C., who was reported missing on Nov. 7th, 1917, is now presumed killed. He was the only son of Herbert Ruffell Grimwood, Esq., of Villa Thoüin, Florence, and grandson of the late Jeffery Grimwood Grimwood, Esq., of 29, Ennismore Gardens, S.W., and Woodham Mortimer, Essex.

MARRIAGES.

TOTTENHAM—BOWEN PERKINS.—On April 30th, at the Holy Cross Church, Cowbridge, Harold W. L. Tottenham, late Rifle Brigade and R.A.F., only surviving son of Charles Tottenham, D.L., and the Honourable Mrs. Tottenham, Tudenham, Mullingar, was married to Veronica, only daughter of Doctor and Mrs. Bowen Perkins, of Tilbury and Dinas Cross, Pembrokeshire, by the Rev. L. J. Hopkin James, uncle of the bride, assisted by the Rev. W. F. Evans and the Rev. D. M. Davies.

WRIGHT—GOSFORD.—On April 26th, at Kensington,

Lieut. Horace Charles Wright, late R.A.F., was married to Hilda, youngest daughter of Mr. and Mrs. T. W. Gosford, of Evesham, Worcestershire.

Mr. Wright will be remembered as one of the very early members of the Royal Flying Corps, and one of the first N.C.O. pilots. He was invalided out of the Service comparatively early in the war, and did some useful training work as Civilian Manager of an aerodrome near Birmingham. On recovering his health he re-enlisted in the Flying Corps, and, in a comparatively short time, won a commission. He was recently demobilised, and is now engaged in organising an extensive scheme of Civil Aviation.

AIR FORCE.

Deaths.

KNOTT.—An aeroplane taking Major-General Sir F. H. Sykes, Controller-General of Civil Aviation, to Paris, met with an accident on May 3rd at Kenley. The pilot, Captain E. M. Knott, A.F.C., R.A.F., was killed. Major-General Sir F. H. Sykes was badly shaken, but was able to motor to London. He was removed in the evening to a private nursing home.

The accident occurred at a height of about 50 ft., within a few seconds after the machine had begun to lift from the ground. The engine suddenly gave out, and the machine crashed to the ground. General Sykes scrambled out of the machine, and himself extricated Captain Knott, but the latter was so severely injured that he died on his way to the hospital.

Captain E. M. Knott was a picked man, and had seen oversea service. He had been an instructor, and had crossed the Channel many times.

Captain E. Middleton Knott, A.F.C., R.A.F., was the only son of Dr. and Mrs. Knott, of Sutton Coldfield, and was 20 years of age.

PERRIN AND HAYNE.—Major Maurice Nasmith Perrin, R.A.F.M.S., medical officer at Castle Bromwich Aerodrome, and Capt. Hayne, R.A.F., were killed in a flying accident on April 28th.

They were flying a Bristol fighter and when 150 ft. up the machine fell to earth. Capt. Hayne was killed at once, and Major Perrin died from his injuries in hospital the same night.

SALMOND AND HARWOOD.—Lieut. Frederick Salmond, R.A.F., and Lieut. Gearld Harwood were killed while flying in Sussex on May 2nd. They had just left Ford Aerodrome when the accident occurred. The third occupant of the aeroplane, Lieut. de Gersigny, was slightly injured.

Engagements.

DRUDGE—TRENOWATH.—The engagement is announced of Capt. George Frederick Drudge, R.A.F., of "The Avenue," Freshwater, Isle of Wight, and Nellie, eldest daughter of Mr. and Mrs. W. Trenowath, of "Ouse House," King's Lynn, Norfolk.

KEMPT—SNOW.—A marriage has been arranged between Capt. W. E. Kemp, A.F.C., R.A.F., only son of Mr. Ernest Kemp, of Buenos Aires, and Margery Olga (Peggie), only daughter of the late Colonel E. Brighouse Snow, R.M.L.I., and of Mrs. Brighouse Snow, 8, Pont Street, S.W.

Marriages.

CRAWFORD—MANNERS.—On April 23rd, in Bassingthorpe, Capt. Charles Crawford, R.A.F., youngest son of A. A. and Mrs. Crawford, Bombay and Zurich, was married to Winifrede, youngest daughter of the late A. W. J. M. Manners and Mrs. Manners, Bassingthorpe, by the Rev. E. M. Tweed.

FURMIDGE—BRIGHT.—On April 28th, at St. George's, Hanover Square, Lieut. Percy Ward Furmidge, 1st South African Infantry, of Kimberley, S. Africa, second son of the late Mr. S. Furmidge, and of Mrs. S. Furmidge, of Kimberley, was married by licence to Sylvia Salwey Bright, W.R.A.F., elder daughter of Dr. and Mrs. A. L. Bright, of 3, Royal Crescent, Brighton, by the Rev. T. J. James, M.A., M.C., Vicar of St. Anne's, Brighton.

GRABOWSKY-ATHERSTONE—HALES.—On April 28th, at St. Mary Abbot's, Kensington, Capt. Noel Grabowsky-Atherstone, A.F.C., R.A.F., eldest son of C. Grabowsky, of Shandon, N.B., was married to Evelyn Susanna Atherstone, elder daughter of Lieut.-Colonel H. M. A. Hales, Gloucestershire Regt., by the Rev. A. L. Keith.

GUINEY—PASSY.—On April 29th, at St. Peter's, Cranley Gardens, Lieut. Ronald Mortimer Guiney, R.A.F., was married to Helen Dorothy Irene, elder daughter of the late Lieut.-Col. H. E. Passy and Mrs. Passy, by the Rev. C. S. Woodward, Vicar.

PACKE—BARCLAY.—On April 24th, at Holy Trinity Church, Hertford Heath, Capt. Edward E. Packe, R.A.F., son of the late Rev. W. J. Packe, of Wickham Bishop, was married to Claudia Lilian, daughter of the Rev. and Mrs. Charles W. Barclay, of The Vicarage, Hertford Heath, Herts, by the Rev. Charles W. Barclay, father of the bride, assisted by the Rev. E. H. Fellows, cousin of the bridgegroom.

Birth.

REDGRAVE.—On April 25th, at St. Stephen's Avenue, Ealing, to Muriel, wife of Capt. Gilbert Redgrave, R.A.F.—a son.

AIRCRAFT IN THE DARDANELLES OPERATIONS.

The following, which were published on May 3rd, are extracts from the enclosure contained in a letter from Vice-Admiral S. H. Carden, R.N., to the Secretary of the Admiralty, dated March 17th, 1915, and describing operations against the Turks at the Dardanelles :—

"The attack on the defences of the Dardanelles commenced on Feb. 19th, 1915.

"Air reconnaissance on the 17th, 18th, and on the 19th confirmed information in our possession with regard to forts Nos. 1, 3, 4, and 6, except that an additional gun was shown in eastern bastion of fort No. 6.

"Seaplanes also reported that some minor earthworks and trenches appeared to have been extensively prepared for the defence of possible landing places.

"The 'Vengeance' (flag of Rear-Admiral de Robeck) was ordered to take station as convenient to observe the fire of her division.

"Feb. 19th, 0.55.—A seaplane was ordered off to spot for 'Vengeance,' but owing to wireless troubles in seaplane no results were obtained. From Feb. 20th to 24th inclusive the weather was too rough to continue operations, and no reconnaissance by seaplane was possible.

"Feb. 25th.—The weather being favourable, operations were resumed. No seaplanes took part, the sea being too rough for them to rise off the water.

"Feb. 26th.—Seaplanes carried out reconnaissances inside Straits, in order to locate batteries, etc. Amongst other details they reported battery 8 now contains eight guns. Many positions for guns have been prepared on both shores.

"March 3rd.—Seaplanes carried out useful reconnaissances, without, however, being able to locate batteries firing at the ships.

"March 4th.—Seaplanes reconnoitred the vicinity of ports and villages near them in the morning and reported no movements of troops. Seaplanes attempted to locate the enemy's trenches without success, descending to 2,000 ft. in their efforts to distinguish the positions; one seaplane was hit twenty-eight times and another eight times.

"March 5th.—Three seaplanes were sent off to spot for fall of shot. One met with an accident, and the second was forced to return on account of her pilot being wounded by a rifle bullet. In consequence they were not of assistance in firing.

"March 8th.—Weather too misty for seaplanes to do any spotting.

"March 10th.—'Irresistible,' 'Dublin,' 'Ark Royal' off Bulair. . . . The seaplanes were unable to fly owing to rough weather.

"March 11th.—Seaplanes carried out reconnaissance for the ships operating off Bulair."

The following are extracts from the enclosure contained in a letter from Vice-Admiral de Robeck to the Secretary of the Admiralty, dated March 26th, 1915 :—

"Report of operations carried out by the Allied British and French Fleets off the Dardanelles on March 17th and 18th, 1915. (All times are local, i.e., two hours fast on G.M.T.)

"March 18th, 1.38 p.m.—Seaplanes reported fort No. 16 firing; 19 hit; 17 hit but firing; new battery at Kephez Point not manned; battery south of Suandere River firing.

"2.31.—Seaplane over forts at 1 p.m. reported troops at Kephez Point. Forts Nos. 13, 16, 17, and 19 all manned and firing. 'Saunders' also firing."

The R.A.F. Mail Service.

One of the R.A.F. aerial mail service routes now being operated in France is that between Maisonceile and Cologne—a distance of 225 miles. The unit responsible for this service is 110 Squadron, and during a recent three weeks, in spite of almost the worst possible weather conditions, there have only been three days when the weather actually prevented the mails being carried.

During this period 465 bags of mail have been carried to Cologne, and on only one occasion has there been a forced landing.

Some idea of the weather conditions prevailing may be gathered from the fact that on the majority of days on which the mails were carried, from March 1st onwards, it was found impossible to continue the training of the homing pigeons attached to the unit. Moreover, as it was necessary to fly through driving rain specially protected propellers had to be supplied as the rain so seriously damaged the ordinary type during one journey that they became unsafe for further use.

Rain and thick clouds have not on any occasion prevented the squadron from flying, but thick ground mist and low fog have been the most serious difficulty.

The average time for all flights for the whole distance is 2 hours and 16 minutes, and the record up to date is 1 hour and 45 minutes. The machines in use are D.H.9 A's.

As the route was a new one to nearly all the pilots engaged, and considering the extremely adverse weather conditions, it is felt that the performance of 110 Squadron is particularly creditable,

BRITISH AIRSHIP BUILDING.

Sir,—The Air Ministry lately issued a report as to the possibilities of the big rigid airship commercially, and talk with a glib tongue of the—at present—mythical "R38," but to be quite fair to the public they should also issue an account showing how little progress has been made during the last four years, and how such progress was made during the first three years when real practical flying men were at the head of affairs, as Captain Strasser was in Germany up to the date of his death in "L70."

The last British rigid off the stocks to prove of any service at all was some nine months ago, and in this ship it was only possible to incorporate some of the ideas gained in the wrecked Zeppelins.

A ship which left its building station a few days before the Armistice was started with all the Huns' ideas in our possession, yet she has had but about nine hours' flying to her credit with a very low maximum height. She has not been able to reach her patrol station, and the official verdict has just been issued to scrap her.

The man-in-the-street will have no faith in this snail pace of progress, and unless a very great improvement is made the Germans will certainly keep the long lead, which our Commission who recently visited their sheds admit they have a right to claim.

Soon after war was declared, a gentleman, through whose efforts the ships of our Navy are to-day coated with special steel, endeavoured to interest the Powers that Were in rigid airship building. On failing to do this he built a small rigid at his own expense, although he was warned as to the size of his craft being too small. He built the hull, made the gas bags and outer cover, bought the engines, and made the car, only to be informed that the ship would not be purchased because it would not ascend to 2,000 ft. In spite of the value of the ship for any experimental work, even though it would not go up a foot, it was allowed to lie in its shed and rot.

Three years after, a ship made of the same material and costing nearly £300,000, is scrapped through a defect that could have easily been proved in the earlier ship.

Is it not a fact that our airship instructors are so at enmity with each other, and each jealous of his neighbour, that the whole progress of lighter-than-air craft is considerably hampered?

Is the scrapping of this new ship to pass unnoticed and without those responsible paying the usual penalty when public money has been exploited in such a manner? What confidence can the workers, to say nothing of the flyers, have in such designers of the future? It is time a sweep was made.

(Signed) "A Disgusted Worker."

A GERMAN VIEW.

According to Mr. Arno Dosch Fleurot, the New York "World's" correspondent in Germany, who had been on a visit to Friedrichshafen, Baron von Guttenburg, the nephew of the late Count von Zeppelin, stated that Great Britain and America would probably divide the air routes of the world, and continued:—

Germany is now ahead of every other country in dirigibles, but her hands are bound on account of losing the war. We are two years ahead of England's latest dirigible, R.33, with whom she evidently expects to cross the Atlantic. From the published details I believe that the R.33 is of the same type as the German 43, which was brought down in England two years ago.

Baron von Guttenberg appears to consider it possible that the air routes of Europe, Africa, and Asia will be controlled by Great Britain, while America will control both the American and the Pacific. He expects that the normal Pacific route will be from San Francisco to Honolulu and Australia, and then north to Japan and back, and is sure that flights anywhere on the earth are feasible.

Baron von Guttenberg commanded a Zeppelin for three years, and he claims to be the inventor of a device which he calls a periscope, consisting of a long cable lowered from a Zeppelin with an observer at the bottom. This enabled a German dirigible to pass over a protecting cloud while the observer below directed operations. He remarked:—

"I always did the observing myself. Once in a flight over Calais I was able to come so low that I could make out a railway station by the slight reflection from lanterns on the earth. I was amused afterwards when I read that bicyclists coming from Dunkirk had been arrested because they were supposed to have given me directions. London was wonderfully successful in concealing herself, only the shape of the Thames gave it away."

It is also stated in the same report that Mr. Fleurot was shown the Zeppelin—it is not clear whether airship or aeroplane—with which Baron von Guttenberg hopes to cross the Atlantic.

THE GRIEVANCES OF FLIGHT CADETS.

Sir,—Having seen "J. R. L.'s" grouse in the April 30th issue of The Aeroplane, I feel justified in placing my case before you, which is as follows:—

I graduated "B" on Nov. 18th, 1918, as a flying officer in Cairo, and appeared in Wing Orders as a "2/Lieut.: Flying 'A' with effect from above date." It also stated in these orders that I was removed from the ranks on being granted a commission. Papers were then given me which enabled me to open an account at Cox's. I graduated "C" as a Scout Pilot on 20/1/19.

Everything went smoothly up to the time that I came home for duty as a 2/Lieut., when I reported to the Air Ministry and was granted a month's overseas leave as an officer.

I then proceeded to Cox's to inspect my accounts, and was told there that as I graduated "B" after the Armistice, I had not been gazetted, and that I was, therefore, graded as a Flight Cadet.

I need not attempt to describe my feelings on hearing this news! My principal cause for complaint is that I was living and doing duty as an Officer from Nov. 18th, 1918, until I arrived in London (Feb. 18th, 1919), and yet I was not informed during that period as to the actual state of affairs.

Naturally, all my friends and relatives, as well as my pre-war employers, knew that I was an Officer, and I think you can imagine the humiliation I felt in having to tell them afterwards that I was still only a Flight Cadet.

On making inquiries at the Air Ministry re my commission, I was informed that the G.O.C., Middle East, had been invested with powers to grant commissions to pupils during hostilities, but that they (the Air Ministry) had sent out instructions after the Armistice cancelling this order. Does it take three months for orders to reach Egypt?

Again, I have not drawn any flying pay since Nov 30th, 1918, and cannot obtain any satisfaction re same. All the various Pay Officers say is that they know nothing about it.

I think you will agree that I, and several other pilots, who are in the same boat as myself, have good cause to grouse.

E. D. B.

P.S.—I am an English Cadet, unfortunately, and, therefore, have no High Commissioner to take over my case as have the Colonial Cadets.

A HANDY MAN.

Does anybody want a thoroughly good reliable man as gatekeeper at an aerodrome, or on a private estate? An ex-R.F.C. sergeant mechanic, one of the pioneers of aviation in this country, is looking for a job involving responsibility and trustworthiness, either in the service of a company or of a private individual. His wife is capable of looking after household affairs, or a small canteen or restaurant. Any inquiries should be addressed, G. S. c/o The Aeroplane, 166, Piccadilly, W.1.

AN ADDRESS WANTED.

Will the writer of a letter from Faversham, who signs himself "Anxious," kindly communicate his name and address to the Editor of The Aeroplane. Without them, it is impossible to answer his questions.



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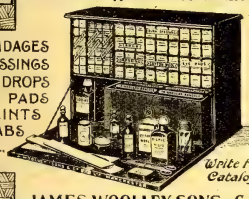
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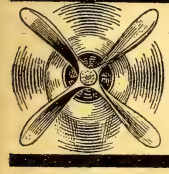
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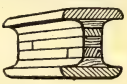
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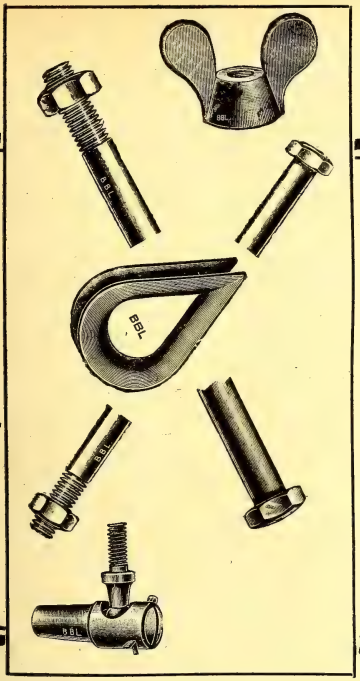
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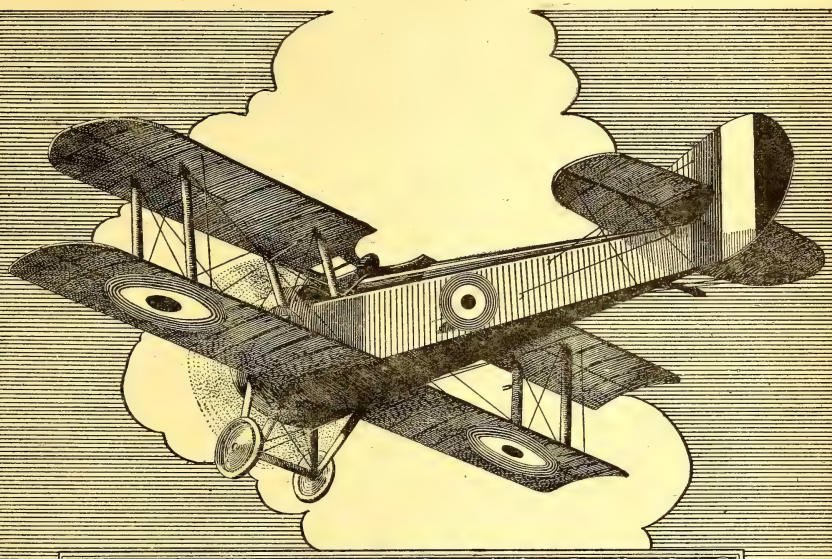
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ON THE REGULATION OF CIVIL AVIATION IN THE BRITISH ISLES.

(PART II.)

As indicated last week, Schedule III of the Regulations deals with the subject of "Certificates of Airworthiness." This Schedule and the Directions relating thereto deal with "Passenger Aircraft," which presumably include mail-carrying aircraft. There is no reference to the airworthiness of privately owned aircraft.

This strikes one as allowing rather too much liberty to mad-headed inventors or ignorant experimenters. So far as one can see there is nothing to prevent any individual, or company, from building a thoroughly dangerous machine and flying it to the public danger. It is well to bear this in mind when reading the Regulations, of which Schedule III is as follows:—

SCHEDULE III.

Certificates of Airworthiness for Passenger Aircraft, and Periodical Overhaul and Examination of such Aircraft.

General.

1. A certificate of airworthiness in respect of one aircraft of any type (hereinafter referred to as "a type aircraft") will be issued by the Secretary of State in accordance with the conditions set out in this schedule at a charge of five guineas.

2. After the issue of a certificate of airworthiness to a type aircraft, any further aircraft of that type will be inspected for airworthiness by employees of the constructor, under arrangements approved by the Secretary of State, and if the aircraft in respect of which a certificate of airworthiness is desired conforms in all essential respects with the type aircraft, and is of satisfactory workmanship and materials, a certificate of airworthiness will be issued in respect of such aircraft by the Secretary of State at a charge of one guinea:

Provided that the Secretary of State may take steps to test the inspection made by the employees of a constructor, and if such test inspection, in his opinion, warrants such a course, may order a further inspection to be carried out by any person or persons duly authorised by him, and to issue or refuse a certificate, as he may decide, after such inspection, or to refuse to issue certificates of airworthiness in respect of further aircraft of the same type as that subjected to such test inspection that have been or may be constructed by the particular constructor.

3. Licences to competent persons for the purpose of this schedule shall be granted by the Secretary of State on compliance with such conditions as he may direct

Type Aircraft.

4. A certificate of airworthiness will not be granted for any type of passenger aircraft until the following conditions stipulated below have been fulfilled:—

(a) The design has been approved by the Secretary of State in regard to safety;

(b) The construction has been so approved in regard to workmanship and material used; and

(c) A satisfactory demonstration in accordance with the directions of the Secretary of State has been made in flying trials that the aircraft is safe for the purpose for which it is intended.

The Corresponding Directions.

The Directions corresponding to the foregoing Regulations read as follows:—

III.—CERTIFICATES OF AIRWORTHINESS.

1. With reference to Regulation 2 (1) and Schedule III, applications for certificates of airworthiness should be made to the Secretary, Air Ministry, London, W.C.2.

2. Application forms will be supplied on demand.

Type Aircraft.

3. Subsequent to the forwarding to the Secretary, Air Ministry, of an application form duly completed for a certificate of airworthiness for a type aircraft, the applicant shall forward to the Director of Research, Air Ministry, general arrangement drawings of the proposed aircraft, together with such particulars of load, fuel, engines, etc., as will enable a preliminary opinion to be formed as to general safety.

4. The applicant shall forward subsequently such drawings and particulars of the proposed aircraft as may be necessary for the checking in detail of the safety of the aircraft.

The information and drawings required for this purpose should be, where, applicable, in accordance with forms to be supplied on application. (C.O. Forms 12 and 13.)

(Blue prints or rough sketches may be sufficient to enable the said checking to proceed, provided they are fully dimensioned.)

5. The applicant may proceed with the construction of any part or parts of the aircraft as and when these are approved by the Secretary of State.

6. The workmanship and materials of construction of the aircraft shall be approved by the Secretary of State in accordance with detailed directions in para. 20 below.

7. On completion of the aircraft, flying trials will be carried out by the applicant's or constructor's pilot in the presence of representatives of the Secretary of State.

8. After the satisfactory completion of the check calculations, inspection, and applicant's flying trials, and after any modifications considered necessary for safety have been completed to the satisfaction of the Secretary of State, the applicant will be instructed to deliver the aircraft to the official aerodrome for official trials.

9. At any time prior to the delivery of the aircraft for official trials, modifications to the aircraft may be made by the applicant, provided that full particulars and drawings of the proposed modifications are first submitted to the Director of Research, Air Ministry, and that such as affect the safety of the aircraft are approved by the Secretary of State.

10. During official trials, which may be attended by a limited number of representatives of the applicant, the aircraft will be in the charge of the representatives of the Secretary of State, but the Secretary of State and or his representatives shall not be liable for any loss or damage caused to such aircraft during official trials.

11. If any modifications are considered by the Secretary of State to be necessary for the safety as a result of such official trials, such modifications shall be carried out by the applicant, and on completion thereof the aircraft shall be delivered, if required, for further official trials.

12. On the completion of official trials the applicant will be notified, and reports on calculations and tests will be supplied to him by the Secretary of State on application. The aircraft will either be handed over to the applicant at the official aerodrome for removal, or will be delivered by an official pilot to an aerodrome selected by the applicant, and approved by the Secretary of State

13. On the satisfactory completion of the official trials, and after the completion to the satisfaction of the Secretary of State of any modifications considered necessary for safety, a certificate of airworthiness will be issued. Prior to the issue of such certificate the applicant shall deliver to the Director of Research, Air Ministry, a complete set of working drawings (process tracings) of the aircraft.

Subsequent Aircraft.

14. Following the receipt by the Secretary, Air Ministry, of an application form, duly completed, certificates of airworthiness for subsequent aircraft which conform in all essential respects with a type aircraft for which a certificate of airworthiness has previously been issued will be granted subject to the following conditions and procedure.

15. The applicant may make modifications (including change of engine type) to the aircraft and may depart from the approved complete set of working drawings (process tracings) of the type aircraft that are in the possession of the Secretary of State; but full particulars and drawings of the proposed modifications shall first be delivered to the Director of Research, Air Ministry, and such as affect the safety of the aircraft shall be approved by the Secretary of State.

16. During the construction of the aircraft the inspection of the workmanship, construction, and materials shall be as approved by the Secretary of State in accordance with detailed directions in para. 21 below.

17. In the case of an aircraft, which in the opinion of the Secretary of State differs considerably from the type aircraft, or in the case of an aircraft built by a constructor not familiar with the type aircraft, on completion of the aircraft, the Secretary of State may require flying trials to be carried out, by the applicant's or constructor's pilot, in the presence of his representatives, and/or may require the aircraft to be delivered to the official aerodrome for additional trials. The procedure in this case will be in accordance with the procedure governing similar trials in the case of a type aircraft, as laid down in paras. 10, 11, and 12 hereof.

18. On the satisfactory completion of the aircraft and of any trials that may be required by the Secretary of State, and when any modifications considered necessary for safety have been completed to the satisfaction of the Secretary of State, a certificate of airworthiness will be issued.

Prior to the issue of such certificate, the applicant shall deliver to the Director of Research, Air Ministry, a complete set of working drawings (process tracings) of any modifications to or departure from the type aircraft.

19. In the foregoing directions the term "aircraft" includes the aircraft and all equipment (unless the context otherwise implies), except that working drawings will not be required for engines or equipment of approved types.

Method of Approval of Workmanship and Materials.

20. Type Aircraft.

(*a*) Inspection of type aircraft will be carried out by representatives of the Secretary of State.

(*b*) The Director of Aircraft Inspection will accept wherever in his opinion possible the inspection of details, components and/or materials for type aircraft made by the employees of the constructor under the supervision of his representative, but each component will be finally inspected and approved by a representative of the Director of Inspection, who will co-operate with the constructor's inspecting staff.

Constructors must notify Director of Aircraft Inspection seven days before commencing work on any part of the aircraft, the inspection of which is necessary prior to further work.

(*c*) The constructor must also fulfil the conditions detailed hereunder for subsequent aircraft.

21. Subsequent Aircraft.

(*a*) Constructors must satisfy the Secretary of State that their inspecting staff is such as to ensure that aircraft passed by them conform in all essential respects to the type design.

(*b*) Constructors must purchase material to the specifications approved for the type design, and must arrange that each and every batch of such material is proved to comply with such specifications by suitable examination, sampling and testing, as may be approved by the Director of Aircraft Inspection.

(*c*) Constructors must make such arrangements at their works as will preclude the use of material other than that approved as in para. (*b*) above.

(*d*) Constructors' inspecting staffs, referred to in 21 (*a*) above, must stamp or otherwise provide means for the identification of each and every detail, in such a way that the individual responsible for such approval can subsequently be traced, selective inspection being adopted where considered possible.

(*e*) Constructors must issue only details or parts approved as in para. (*d*) above to the shops for assembly into components.

(*f*) Constructors must maintain an efficient process inspection during such work of assembly, and record such inspection on a process card for each component. Every component must be finally inspected by a qualified member of their inspecting staff, who will stamp the component in such a way that he may afterwards be identified, and will also sign the process card.

(*g*) Constructor's methods of carrying out the following operations must be approved by the Director of Aircraft Inspection, or other recognised authority, viz.: Heat-treatment of steel, seasoning and conversion of timber, glueing of important parts, and doping.

(*h*) Constructors must ensure that all instruments and other parts affecting airworthiness purchased from sub-contractors have been inspected and approved in accordance with these conditions.

(*i*) Constructors (aircraft or engine as may be arranged) must ensure that all engines have been inspected and approved in accordance with these conditions, and, further, that they have satisfactorily undergone such bench tests as are required by the Secretary of State, and for this purpose that suitable test stands and accessories are provided to the satisfaction of the Director of Aircraft Inspection.

(*j*) Aircraft constructors must carry out an efficient inspection of the installation of all engines, instruments, and parts that are fitted by them into the aircraft, such inspection to ensure that they function correctly, the individual responsible being indicated by a signature on the process card referred to above.

(*k*) Constructors must limit the power of their inspection staff to grant concessions to matters which do not affect the weight, the strength, or the functioning of the part. Should any of these points be affected, the matter must be referred to the designer of the aircraft, and, if affecting the type design, to the Director of Research as laid down for modifications to type designs.

Comments.

Here at the very beginning we have, in paragraph 3, matter for a very pretty argument. The applicant for a certificate of airworthiness "*shall* forward to the Director of Research, Air Ministry, general arrangement drawings of the proposed aircraft," etc., etc. In other words he *shall* give away to Government officials all the tricks of his trade, which may—and, judging from war-time experience, very probably will—be given away to his competitors before his "Type Aircraft" is ready for the market.

As against this, the omission of all mention of private machines makes it possible for a constructor to build his "Type Aircraft" and test it as a private machine. If it proves to be satisfactory he can then submit the necessary drawings, calculations, and so forth, and proceed in the required formal manner with the next machine of the type. So that actually the second machine of the type becomes the "Type Aircraft."

In fact if he has the courage to back his opinions he can build a dozen or a hundred machines as "private" aircraft before submitting his designs for official approval (and private circulation—again judging from war experience). Then, despite the usual official delays which are bound to occur when at last the Department of Research passes his "Type Aircraft" for public service, he will be ready with a whole batch of machines for the market, before his competitors are ready to equal or beat his latest products.

The Gentle Art of Wangling.

The one thing which this war and its endless—and generally idiotic—Government control has taught us is the gentle art of wangling. And here at the very beginning of the technical side of Civil Aviation is a splendid example of attempted Government interference which simply asks for a wangle to get round it.

After which the kindly permission given in paragraph 5 is merely funny. But these Directions give one an uncomfortable feeling that some of the officials of the Technical Department, fearing that they may not be able to find a job in civilian employ, have fixed up a little wangle of their own, so that they may keep their Government jobs, and presumably their R.A.F. ranks and rates of pay.

It would be of interest to know whether the people in the Department of Research—who, so far as one knows, have never produced anything of value to the progress of aeronautics—are to bear Service rank, or whether they are to be mere civilian officials. There is nothing in the Directions to indicate which they will be. There is much virtue in a uniform and a brass hat when dealing with civilian business men who are dependent on official approval or on official orders for their livelihood.

The Proof of the Pudding.

Paragraph 4 of Schedule III of the Regulations is

excellent in itself, but the first seven paragraphs of this section of the Directions strike one as being entirely unnecessary, and as being invented solely to provide work for people who could not earn a living outside a Government Department. The whole seven could have been boiled down into a statement to the effect that anybody is at liberty to build a passenger aircraft, but that before it can ply for hire it must be approved as stated by the officials appointed for the purpose.

The proof of this lies in a case which has actually occurred. A certain firm has altered its standard two-seater so that it seats four passengers in addition to the pilot. The Air Ministry authorities only license it to carry two passengers and pilot, with the present type of engine—wherein one agrees with them entirely. But that does not prevent the owner of one of these machines from taking up five non-paying passengers and himself as pilot, just to prove to his own satisfaction that it can carry six people and therefore is safe with five.

The Matter of Tests.

Another point which deserves attention is concerned with paragraphs 8 and 10 of Section III of the Directions. The "Type Aircraft" is to be delivered to the official aerodrome for the official trials (paragraph 8), but the Government shall not be liable for damage during official trials (paragraph 10). If the official trials are to be adequate they must be made by an official pilot—so much is mere common sense—and paragraph 12 says that the machine will be delivered by an official pilot to the applicant after its tests. But if the machine is wrecked by an official pilot, or burnt by official carelessness, or smashed in a collision on the ground by a Government machine, the owner pays.

At this rate aircraft building looks like being a paying game, does it not? Or else somebody is out to help the insurance companies. In either case the official tests are likely to be an expensive entertainment for the makers of aircraft.

Contrasts in Methods.

Yet another point concerns the whole system of official tests. Type tests may take a few days, or they may be spread over months, according to the competence or honesty of the officials concerned with them.

For example the type tests of seaplanes and other R.N.A.S. machines at the Isle of Grain were put through in a day or two by clever R.N.A.S. pilots under keen and efficient officers. If the Navy found itself towards the end of the war without seaplanes fit to beat the Brandenburgers it was no fault of the people at Grain, who had passed and approved types which were better than the Brandenburgers before the latter ever appeared over the North Sea.

On the other hand the R.F.C. technical people ran their affairs so badly that type tests took months. The pilots and officers of the actual test aerodromes did their work thoroughly well, but the people who had to deal with their results fiddled and footled about with figures and calculations, and demanded further tests and details thereof till machines were out of date before they came into service, or else they never came in at all.



CROSSING THE ANDES.—An authentic photograph of Lieut. Cortinez (Chilean Army) crossing the Andes on April 4th, from Santiago (Chile) to Mendoza (Argentine) and back, reaching a height of nearly 20,000 feet. The machine was a Bristol monoplane presented by the British to the Chilean Government. The photograph was taken in a low pass at 13,000 feet, and illustrates the nature of the Andean country. It is, therefore, of special interest in connection with Commander Dyott's forthcoming lecture to the Royal Aeronautical Society, to which reference is made on page 1908.

Thus the F. type Martinsyde, the fastest machine in the world by some 20 miles an hour, and the best climber, was put in for test about the Summer of 1917, and the geniuses of the Technical Department had just made up their minds to approve it when the Armistice was signed. Similarly the Bat "Bantam" was submitted for test about the Autumn of 1917, and was admitted by all the test pilots at Farnborough and Martlesham to be by far the most easily manœuvrable fighting machine and the best prospective "Hun-getter" they had ever flown. Yet the paper people at the Bolo House and Bolshevik Mansions (as the commandeered office in Kingsway were called) played about with it to such an extent that it was never put into production at all.

What one wants to know is whether the future of our Commercial aircraft is to depend on clear-headed practical businesslike people such as those who have been running things at the Isle of Grain and Martlesham, or whether it is to be hampered by a lot of academic idiots in the Research Department (late of the Technical Department), so that our foreign competitors are to be allowed to get ahead of us? Perhaps the Civil Aviation Department of the Air Ministry will be so good as to issue supplementary Directions making this clear.

Subsequent Aircraft.

There can be no quarrel with paragraphs 14 to 19 of the Directions. The requirement of paragraph 17 that machines built by "a constructor not familiar with the type aircraft"—*id est* a sub-contractor—shall be submitted to type-trials is quite reasonable, assuming that the trials are in accordance with the methods of Grain and Martlesham, and not with those of Bolshevik Mansions.

But here again it will be necessary to keep an eye on the Technical Department lest their delays of modifications (paragraph 15) give our competitors abroad a lead on us. It seems well that we have an Air Party in Parliament to keep on stirring up laggard officials.

Methods of Approval.

The whole of paragraphs 20 and 21 deal with the work of the Peace-time A.I.D. Though the A.I.D. during the war has come in for much abuse—chiefly deserved—the Department founded by the late and ever-to-be-regretted Colonel Fulton retains much of his tradition and has done much good work. It remains to be seen whether those who have carried on the Fulton tradition under General Bagnall-Wild will remain in Peace-time, or whether the A.I.D. will become—as the Technical Department threatens to become—merely a refuge for incompetents who cannot find jobs as civilians.

One hears satisfactory rumours about the department, as, for example, that it is to return to the Admiralty method of inspection, under which the completed machine or engine is inspected and the whole job condemned if a part is wrong. If true this is excellent news, for it means decreasing the number of officials, and so it means that those who remain can be of the best quality.

Half, or more than half, the trouble in the A.I.D. was due to the thousands of officials employed, mostly of limited intelligence, for whom it was necessary to lay down masses of rules of procedure which seriously hampered the work of the small percentage who possessed intelligence. Now it should be possible to abolish procedure and depend on the intelligence of a few skilled men.

Also, if a manufacturer is going to have a whole machine scrapped on account of a defective detail he is going to be a heap more careful about his detail work than he was when every bit of his machine was inspected and stamped A.I.D. before it was assembled. In those days if a bad piece of detail work necessitated the taking asunder of a complete machine, the Government paid, because the bad piece had been passed A.I.D. Under the Admiralty, and one hopes the new A.I.D., scheme the maker would pay.

Though the Directions do not specifically state that this method of inspection is to be adopted, paragraph 21 makes it fairly clear that such is the scheme as concerns the inspection of "Subsequent Aircraft." Apparently, and very rightly, "Type Aircraft" are to be inspected in detail.

The Next Instalment.

Considerations of space forbid further discussion of the Regulations and Directions this week, so one postpones till next week the very important Regulations concerning the Periodic Overhaul of Aircraft, and of Examination before each Flight, together with the Directions concerning "Persons Competent to Undertake Periodical Inspection and Overhaul and Examination before Each Flight to Aircraft." There is much of interest in these sections, especially in the question of who is a competent person and who is not.—C. G. G.

(To be continued.)

THE AUSTRALIAN £10,000 FLIGHT.

It is now nearly eight weeks since Major-General Sir Frederick Sykes announced at the dinner of the Society of British Aircraft Constructors that the Australian Government had offered a prize of £10,000 to the first Australian aviator to fly from England to Australia. Until May 12th, when the "Times" published a paragraph on the subject, nothing further had been heard about competition for this prize, but those who are on the inside of things know that several Australian pilots intend to try and win that prize, and that one at least of them had begun making his arrangements to fly to Australia some weeks before the Australian Government offered a prize at all.

The "Times" paragraph reads as follows:—

FLIGHT FROM ENGLAND TO AUSTRALIA.

Another £10,000 Prize.

The preliminary conditions of the Australian Government's offer of a £10,000 prize for the first Australian airman to fly from Great Britain to the Commonwealth have been arranged at a conference attended by representatives of Mr. Andrew Fisher, High Commissioner for Australia in London, the Royal Aero Club, and the Air Ministry.

The prize, which must be won before Dec. 31st, 1920, is open only to Australians in seaplanes, flying-boats, or aeroplanes of all-British make. The distance, varying from 15,000 to 17,000 miles, according to the route, must be completed in 720 hours. A disabled machine may be towed a total distance of 100 miles, but no further than 20 miles at any one time.

It is probable that the route chosen by aeroplane pilots will be as follows:—Hounslow, Paris, Lyons, Nice, Genoa, Rome, Cyprus or Rhodes, Damascus, Bagdad, Basra, Karachi, Calcutta, Rangoon, Penang, Singapore, Batavia, Kupan (Timor), and Port Darwin (North Australia).

The reason why nothing has been said in this paper about the preparations made by these pilots is that, being men who are in deadly earnest, they did not want one to talk about what they are going to do, but wanted to do it first and talk about it afterwards.

The reason why nothing has been heard from the Air Ministry about the flight is the obvious one that nothing much can be said about it until the International Aero-

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nautical Convention has been signed, sealed, and delivered, but one happens to know that a number of officials at the Air Ministry have expended considerable time and trouble in obtaining information which will be of use to the pilots who intend to try to win the £10,000. These officials deserve every commendation for the good work they have done in this direction.

What does seem to need some explanation, however, is that nothing has been heard from the Royal Aero Club concerning the proposed flight. As the Governing Body of the Sport of Aviation it was to be assumed that the Aero Club would have some hand in formulating rules, and one gathers that within the last few days some attempt has been made in this direction. It is, however, an interesting subject for debate whether the Royal Aero Club has actually any *locus standi* at all in the matter of this flight.

The Australian Government made a definite straight offer to pay £10,000 to the first Australian aviator who flies from England to Australia. No conditions were attached to the offer, and no time was specified at which or within which the pilot endeavouring to win the prize should make his attempt.

It would obviously be necessary for the pilot to prove that he had flown the distance and had not covered it by boat or by rail, or that he had not had his machine transported across the Arabian desert by a camel caravan, for example; but beyond these necessary checks on the good faith of the pilots, one cannot see that anybody has any right to lay down any regulations at all.

Unwarranted Interference.

There is some talk of the Royal Aero Club laying down definite regulations, as, for example, that no competitor may start before a certain date, and that every competitor must report himself at certain definite places, which in motor-racing parlance would be called "controls." Such regulations as these are directly in contravention of the spirit of the Australian Government's offer.

Fixing a date before which competitors may not start means that competitors who have had the enterprise and energy to make their preparations early will be deliberately handicapped in favour of others. It might even prevent a very clever and energetic competitor from starting and winning the prize on his own hook while competitors backed by big commercial concerns were laying plans and making preparations for costly assistance at stated points, and so it would give them an unfair advantage over a lone-hand sportsman.

Fixing certain "controls" would be equally an interference with the spirit of the competition, in that the competition was obviously intended to encourage enterprise and good piloting. Therefore the really clever and daring pilot who chose to lay his own course would, in the case of fixed "controls," be handicapped by being compelled to follow an official course which, as in the previous case, would be all in favour of a less daring or less skilful competitor backed by big commercial concerns.

The only rules which are necessary for the competition are that the pilot shall leave England and arrive in Australia and shall prove to the satisfaction of the Australian Government that he made his journey by air.

Even the date of the opening of International Flying under the International Aeronautical Convention does not matter very much, because if one competitor has the enterprise to go to the Embassies of the various countries over which he must pass (which are practically only France, Italy, and the Dutch East Indies, and perhaps Greece), and if he can get a permit to fly over those countries on this particular flight, there is no reason why he should not do so. In fact, he should be encouraged to do so, because a certain amount of flying has already been done, despite the fact that the International Convention has not been signed.

For instance, though one may be wrong, one is under the impression that when Sir Woodman Burbidge flew to Brussels on an Airco machine he was not actually flying on Government service and that he was not flying in a Service machine. It would be interesting to know whether he even obtained a special permit from the Belgian Government to fly over Belgian territory, or whether it was assumed, as it reasonably might be, that as he was going to Brussels for the benefit of trade with Belgium, no such permit would be necessary.

Taking all these points into consideration, one fails utterly to see why any competitor who has had the enterprise and energy to make his preparations during the past few weeks should be prevented by the Air Ministry or the Royal Aero Club from starting to-day or to-morrow if he is ready.

Furthermore, though one has always been entirely a supporter of the Royal Aero Club in its well-meant attempts in the past to regulate the sport of flying in this country, one cannot see that it has any place whatever in the regulating of a flight for a prize offered by an Allied Government to one of its own subjects. As a matter of International courtesy, the Aero Club ought naturally to do everything it can to assist the competitors in starting from this country, but, so far as one can gather, the Aero Club's efforts hitherto appear to have been directed rather to preventing the competitors from starting at once from this country.

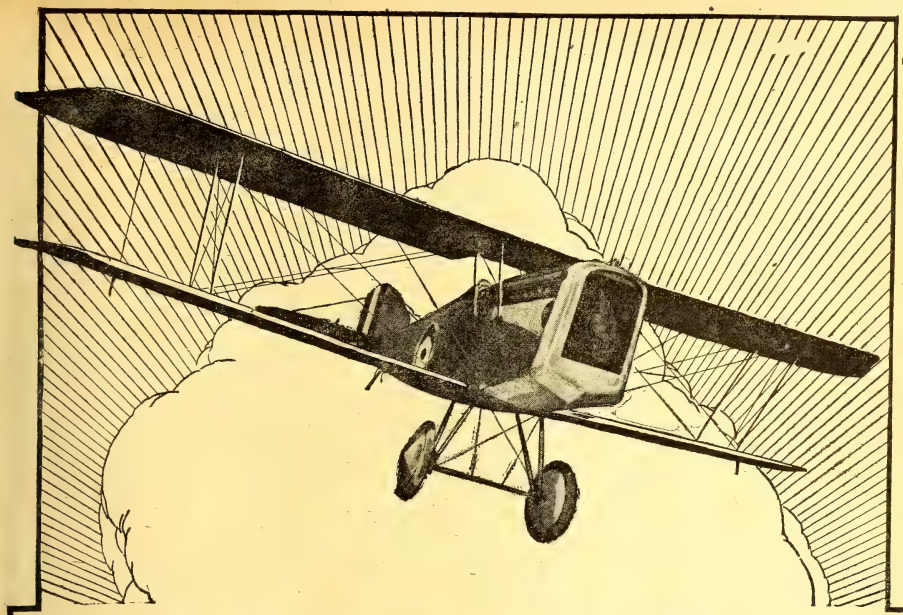
Colonial Independence.

It would be quite interesting to see what would happen if the High Commissioner of the Australian Commonwealth were to take a personal interest in the matter and request the Air Ministry to issue a special permit to Australian pilots authorising them to leave this country by air on their way to Australia, and if he were also to approach the French, Italian, and Dutch Governments, asking them for permits authorising the said Australian aviators to pass over their territory on their way to Australia.

Officers of the Australian Flying Corps are not actually under the Air Ministry at all, and would only have to obtain permission from the Australian Army authorities to leave the country in the ordinary way, and if backed by their own national authorities they should have very little difficulty in getting flying permits from the Air Ministry. One imagines that Australians actually serving in the R.A.F. would also have very little difficulty in getting permission if backed by their own authorities.

One draws attention to these various points in the interests of aviation as a whole, for it is fairly obvious that the sooner attempts to win the Australian prize begin the better it will be for aviation in Australia. As one has said, several Australian pilots have their preparations well advanced, and one at least has been actually ready to start for over a week, so that not only the Government authorities but the Aero Club officials are actually hindering enterprise.

Further delays will mean that instead of the competitors reaching the Indian and Malayan sections of their journey at the best time of the year, they will reach the tropics at the monsoon period, when they are very much more likely to be lost, or at any rate wrecked on the way, than they would have been if they had been able to start at any time during the past month. One hopes, therefore, that those who are concerned with the handling of this matter will give it their prompt attention and will do their very best to assist enterprise instead of hampering it.—C. G. G.



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THE PEACE TERMS.

The following is taken from the official abstract of the Peace Terms published on May 8th :—

SECTION V.

Military, Naval, and Air Clauses.

"In order to render possible the initiation of a general limitation of the armaments of all nations, Germany undertakes directly to observe the military, naval, and air clauses which follow."

Air.

The air clauses provide that the armed forces of Germany must not include any military or naval air forces. Germany is, however, to be allowed to maintain a maximum of 100 unarmed seaplanes up to October 1st, 1919, to be exclusively employed in searching for submarine mines. The entire personnel of the air forces in Germany is to be demobilised within two months, except for a total of 1,000 men, including officers, which may be retained up to October.

The aircraft of the Allied and Associated Powers are to enjoy full liberty of passage and landing over and in the territory and territorial waters of Germany until January 1st, 1923, unless prior to that date Germany is admitted to the League of Nations or is permitted to adhere to the International Air Convention.

The manufacture of aircraft and parts of aircraft is forbidden throughout Germany for six months.

All military and naval aircraft (including dirigibles) and aeronautical material are to be delivered to the Allied and Associated Governments within three months, except for the 100 seaplanes already specified.

THE ROYAL AERO CLUB.

Entrance Fee and Subscription for New Members.

In accordance with the resolution passed unanimously at the annual general meeting of the Royal Aero Club, on March 31st, 1919, the subscription for members elected on or after May 31st, 1919, will be £7 7s per annum and the entrance fee, £5 5s.

Club Bedrooms.

The House Committee at its meeting on April 28th, 1919, decided that the price of bedrooms on and after May 1st, 1919, should be 6s. per night.

The Flying Services Fund.

A meeting of the Flying Services Fund Committee was held on Wednesday, April 30th, 1919, when there were present :— Brig.-Gen. R. H. More, C.M.G., in the chair, Mr. Chester Fox, Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F., and Mr. Harold E. Perrin, Secretary.

Grants and Allowances.

The following grants and allowances were made :—

(33) A continued allowance of £2 a month for six months to the widow of a 2nd Class Air Mechanic in the Royal Flying Corps who had been killed on active service

(53) A continued allowance of £4 a month for six months to the mother of a Leading Mechanic in the Royal Naval Air Service who had been killed on active service.

(65) A continued allowance of £3 a month for six months to the widow of a 1st Class Air Mechanic in the Royal Air Force who had been killed on active service.

(82) A continued allowance of £2 a month for six months to the widow of a 1st Class Air Mechanic in the Royal Flying Corps who had been killed on active service.

(84) A continued allowance of £2 a month for six months to the widow of a Serjeant in the Royal Flying Corps who had been killed on active service.

(100) A continued allowance of £3 a month for six months to the widow of a 3rd Class Air Mechanic in the Royal Flying Corps who had died on active service.

(105) A continued allowance of £2 a month for six months to the mother of a Cadet in the Royal Air Force who had died on active service.

(147) The school fees up to £20 per annum of the son of the mother of a Cadet in the Royal Air Force who had died on active service.

(165) An allowance of £2 a month for six months to an ex-Serjeant in the Royal Air Force who had been incapacitated on active service.

(167) An allowance of £5 a month for six months to the widow of a Captain in the Royal Air Force who had died on active service.

(176) An allowance of £2 a month for three months to the widow of a Driver in the Royal Air Force who had died on active service.

(178) A grant of £10 and an allowance of £5 a month for six months to the widow of a Serjeant Mechanic in the Royal Flying Corps who had been killed on active srevice.

(180) An allowance of £2 a month for six months to the mother of a Private in the Royal Air Force who had been killed on active service.

(185) An allowance of £2 a month for six months to the widow of a 3rd Class Air Mechanic in the Royal Flying Corps who had died on active service.

(186) An allowance of £2 a month for six months to the mother of a Private in the Royal Air Force who had been killed on active service.

(190) An allowance of £1 a month for six months to the mother of a 2nd Class Air Mechanic in the Royal Air Force who had died on active service.

(191) A grant of £5 and an allowance of £3 a month for six months to an ex-Sec. Lieutenant in the Royal Air Force who had been incapacitated on active service.

The Flying Services Fund.

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The Right Hon. Lord Kinnaird.

Committee.

Brig.-Gen. R. H. More, C.M.G. (Chairman).
Mr. Chester Fox.
Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F.
Lieut.-Col. C. E. Maude, R.A.F.

Secretary.

H. E. Perrin.

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Subscriptions.

Total subscriptions received to April 22nd, 1919, £14,966 1s. 1d.; proceeds of entertainments held by R.A.F. Units in the Field, 904 francs, £35 8s 9d.; total, May 6th, 1919, £15,001 9s. 10d.

R.N. Armoured Cars Old Boys' Association.

All officers and men who have at any time served with the R.N. Armoured Cars and who have not joined the R.N. Armoured Cars Old Boys' Association are requested to send their names and addresses to Lieut.-Commdr. H. E. Perrin, Royal Aero Club, 3, Clifford Street, London, W.1.

FLYING IN PERU AND BOLIVIA.

Those who are interested in commercial flying as such should make a note of the fact that on May 28th Squadron Commander Dyott, late R.N.A.S., will deliver a lecture to the Royal Aeronautical Society on "Flying in South America."

Commander Dyott was invalided out of the R.N.A.S. in 1916, and by way of recovering his health made an extended tour in Peru, Brazil and Bolivia, crossing the Andes a number of times and penetrating into the hitherto unexplored country of the Upper Amazon. In the course of his travels he took a number of photographs and films, and he intends to show these as illustrating the conditions which prevail in that part of the country.

If one considered the pictures by themselves one would conclude that there is no opening whatever for flying in that area, but Commander Dyott has made a special study of the possibilities for aviation in that part of the world and will, one believes, convince his audience that aeroplanes, seaplanes, and flying-boats will play a large part in its development.

The lecture will be held, as usual, at the Royal Society of Arts, John Street, Adelphi, and tickets may be obtained from Mr. W. Barnard Faraday, The Royal Aeronautical Society of Great Britain, 7, Albemarle Street, W.1.

A FLIGHT TO INDIA.

On May 8th, during the flight of five British bombing aeroplanes from London to India, one of them was forced to land at Givry-sur-Orbize, in the district of Chalon, owing to engine trouble. The machine struck a tree as it was descending and nose-dived into a field. The pilot was injured.


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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

And Quite Right, too.

The following paragraphs from the "Globe" of May 10th deserve the attention of all concerned with flying. Not only do they indicate how little the daily news-sheets will defend aviation, but they are, in fact, sound sense in themselves:—

"STUNTS."

The Prince of Wales is so modest and charming that he probably has little conception of the value of his own life in the eyes of other people. Otherwise he would not indulge in "the wild evolutions of a high-flying aeroplane," of which we get a sensational account in a morning newspaper which regards flying as the whole duty of man—at any rate, of young man. According to our contemporary, the Prince of Wales embarked in a "stunting" 'plane with Colonel W. G. Barker, V.C., D.S.O., M.C., R.A.F., who, at the Heir-Apparent's "express wish," gave him "an experience of all the latest flying thrills." The Colonel is one of the most famous flyers, with a wonderful war record, but a permanently disabled arm. He is described as the "Prince of Stunters."

"COMMERCIAL FLYING."

The Prince of Wales is a most gallant young man, and it is only natural that an "air stunt" should have an attraction for him. Nevertheless, we venture to protest at his indulging in this most dangerous sport at the present time, thereby encouraging his contemporaries to do the same. During the war we had to grin and bear the appalling toll on our young man power. It was the inevitable price of victory. It was their glory to pay it. But we are appalled at the really shocking waste of life since the "cease fire" sounded, which we owe to what in peace-time is little better than a craze. Almost every day one opens the paper to read some hideous air tragedy in which the victims are necessarily the most precious part of the nation—all the more precious after our losses of the last five years. "Commercial flying" has already too much to answer for.

Off the Map.

A correspondent relates the following characteristic story:—

A certain number of men have been detailed to proceed to the Azores as a "ground party" for the coming Atlantic flight, and were dispatched to Blandford to be equipped. When they returned it was found that they had been fitted out with fur coats, fur helmets and leather waistcoats! In fact all the North Pole gear!

One now expects to hear of a ground party proceeding to Iceland duly equipped with drill uniforms, sun helmets and refrigerators for the preparation of iced drinks.

The Dangers of Journalism.

A writer in the "Daily News" is responsible for the following, which appears to have escaped the attention of the aeronautical editor:—

"There are people who think Peace-flying as safe as motoring, and others who regard it as a sort of acrobatic performance only attempted by fools. Flying is neither a bird's paradise nor a series of blazing fires, desperate falls, and terrible crashes, although, so far as its dangers are concerned, it is best that the public should be told the truth rather than it should gain the impression that it is 'dead-safe' only to be alarmed later by evidence to the contrary.

"The commonest cause of accidents is engine trouble in taking off. If an aeroplane is about 100 feet up and just over some houses, with more houses in front, and the engine 'conks out,' what can the pilot do? At best he can 'Immelmann turn' and try to get back and land again; but even this, if it is not well done, may cause a side-slip."

The article is headed: "Is Peace-flying Dangerous?" The answer is in the affirmative, if, under the circumstance, specified pilots attempt Immelmann turns at a height of 100 feet with conked out engines, especially if they are "just over some houses, with more houses in front"—presumably, sky scrapers.

One's sympathy would be reserved for the houses.

Or might Exchange for Bath Chair.

The following advertisement appeared in a publication devoted to motor-cycling matter:—

"Aeroplane. 1916 Avro scout fitted with 3-cylinder 35 h.p. air-cooled engine, in perfect order, £40, or sell engine separately; would take motor-cycle exchange."

Kamerad!

The following priceless information has been received by U.S. wireless from Atlantic City:—

"Earl C. Hansen, of California, who has been serving in the radio division of the steam engineering department of the United States Navy, explained to the Pan-American Aeronautical Convention his invention to enable aviators to land even in the densest place, and always to keep in touch with their stations. He explained that the device is a modification of the wireless telephone, enabling aviators, while aloft, to transmit direct to newspapers news from the scene of happening.

"One invention he described as an electric 'scent,' by means of which aviators are able to fly directly over a station and receive electric waves over a powerful wireless telephone attachment, indicating always the exact altitude.

"Major Reed G. Landis described a new rubber-coated propeller, said to be exceptionally durable."

This is the sort of thing that makes one feel inclined to leave aeronautical journalism and turn to the cultivation of vegetable marrows. Really America is not playing the game when she discharges a broadside like this across the Atlantic. One can endure the first paragraph dealing with the wireless telephone that enables aviators to land in the densest places, but the electric "scent" and the rubber-coated propeller are too great a strain on war-worn nerves. After all, the Press Censor had his uses.

Like a Victorian Duchess.

The "Times" in its report of the march of the Dominion troops through London made the following picturesque remarks:—

"It was while the Canadians were marching by that the throb of engines was heard in the sky; and, looking up, one could see the aerial escort of 14 aeroplanes of the Canadian Ais Force. The first seven were arranged in what is called "artillery formation," shaped like an arrowhead; behind came a formation of three and a formation of four; and this disposition was wonderfully maintained while the planes circled about overhead, coming and going throughout all the rest of the march. And for a short time an aerial monster, the airship T.14, floated magnificently about, rising and dipping like a stately Victorian duchess, and gleaming in the bright air."

One hopes that the compliment will not make the T.14 unduly proud. And what is the Canadian Ais Force? For once one is dumb.

"If!"

(An adaptation of Mr. Kipling's poem to meet the requirements of the Ack Emma.)

If you can keep your head when all around you
Are clamouring to tell you how it's done;
If you can let Fate's heavy hammer pound you,
And keep your face turned ever to the sun.
If you can fight—and not grow tired of fighting,
Nor deem the odds too great, the strife too long;
Or being slighted, don't give way to slighting,
But greet your grim reverses with a song.

If you can rise ere yet the dawn comes creeping
On ghostly pinions, through the Eastern sky;
If you can slog when all the squadron's sleeping,
And make your breakfast off an antique pie.
If you can combat duties mean and sordid,
That selfish slackers may not soil their hands;
And see another for your toil rewarded,
Nor meet one friendly soul that understands.

If you consider duty more than pleasure,
And set your shoulder gamely to the wheel;
If you can sacrifice your hard-earned leisure,
And ever bend your back to forge the steel.
If you can take commands from those above you
Who were your office-boys in days gone by,
And make each surly sergeant learn to love you,
Because, like Washington, you never lie.

If you can see conceited fools promoted,
While none put down the mighty from their seat;
If the ideals on which you dreamed and doted
Go crashing down in ruins at your feet.
If you can jog along on Life's broad highway,
Submitting to misfortunes in a mass;
Content to live your life in some dull byway,
You'll be a hero—*and a blithering ass!*

—G. R. S.

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The WORLD of AERONAUTICS (continued)

An Invitation to an Orgy.

Invitations to R.A.F. Squadron dinners are cold and colourless compared with the American method of bidding guests to a feast. The following is an example of the American invitation. Except for the deletion of names it is printed in full, as each word is beyond price :—

Some poor simp has said the war is over. He's wrong, all wrong. We have yet to fight the battle of New York. Here's the big idea All aviators, those who flew and those who wanted to and only talked about it, are invited to attend a grand, great and glorious dinner on May 31d of this year—we say this year as being before July 1st, given by those ancient and dishonourable members of the Montmartre and the Rue Brey Club.

Mr. R——, of 58th Street and 8th Avenue, out of the kindness of his heart, has consented to stage the fight at his gilded palace of crime at the merely nominal fee of eight bucks per plate and person. Be not alarmed, O ye of faint heart and fainter purse, for the said double four includes all the necessaries, including ambulances, a huge dinner accompanied by all the liquor one can drink, a nigger jazz band, the ravishingly beautiful, voluptuous women of R——'s cabaret, who will do their little tricks, smokes and all.

Eight measly little beans covers even the breakages. There will be much and many liquor, also music, and as for women, bring your address books. There will be a special telephone girl on duty for that purpose after 12. Please answer at once, signifying your intention of coming, and tell your flying friends to ask for tickets, too.

The number of guests is limited to 150, so get your applications and checks in early. Make checks payable to Lieut. —— or Lieut. ——, care of the American Flying Club, 11, East 38th Street. Let's make this the greatest souse party of the century. An orgy that will go down into the history of the New York Police Department as the wildest ever staged. The police are fixed.

Signed, COMMITTEE.

P.S.—As a more detail for your own protection all tickets must be paid for before noon on Saturday, May 3rd. There will be no comeback. Dinner is at 7.30.

Mr. Bonar Law's Return.

Mr. Bonar Law arrived at his official residence during the afternoon of May 8th, having flown back from France to England.

Revenge.

Demobilised subalterns from the Royal Air Force, who wish to "get their own back" on their erstwhile Colonels and Majors, are asked to note than an even more efficient method than hissing them when they appear on the stage has been discovered.

It is generally known that certain Field Officers are acting as pilots for firms specialising in joy-rides. A delightful effect may be obtained if a demobbed subaltern quietly and unobtrusively slips a sixpenny-bit into the pilot's hand at the conclusion of a flight.—G. D.

A Bad Case.

Lieut. Arthur Venables Clarke, 26, R.A.F., was charged on remand at Bow Street with stealing an officer's trench coat, belonging to Lieut. C. D. Lang, R.A.F.

Lieut. Lang missed the coat from his room at the Imperial Hotel on March 30th, and later the same day saw Clarke wearing it in the doorway of the hotel.

Clarke was further charged with obtaining £10, £5, and £3 by worthless cheques. He pleaded guilty to all the charges, and was sentenced to six months in the second division.

An official of Messrs. Cox's Bank said that before Clarke's account was closed some 70 or 80 of his cheques presented in Egypt were returned, and since then about 60 cheques have been presented.

The Heyday of Pessimists.

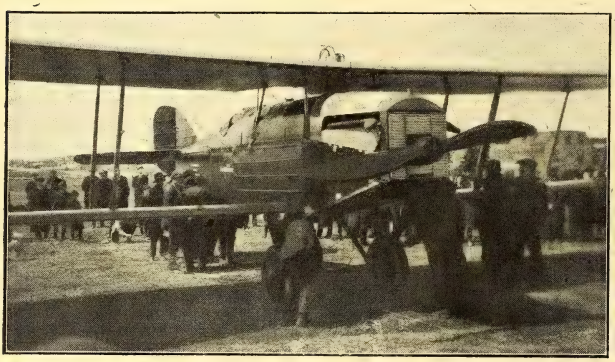
Capt. A. Illingworth, R.A.F., in an address at Newcastle on commercial aviation, said it was somewhat unfortunate that he should be speaking on the subject in the heyday of pessimists.

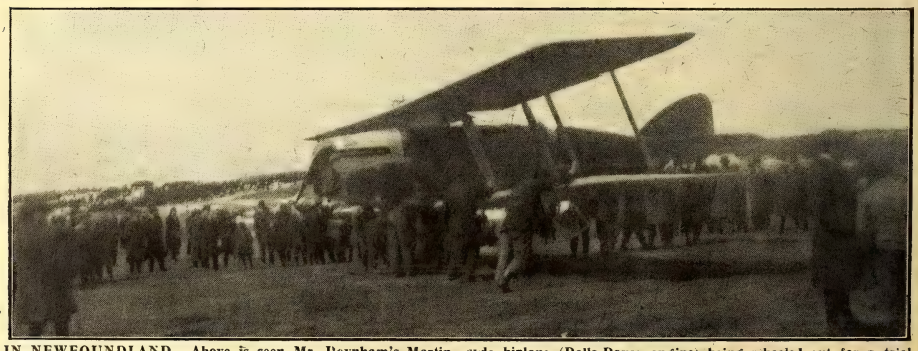
Those who were against civilian aviation were pointing in triumph to the other side of the Atlantic, where there were at present several aviators storm-bound and unable to start for the "Trans-Atlantic Stakes." But the same type of pessimist had existed during the whole history of the commercial development of transport, and commercial aviation was really only a day old. In five years aviation had made tremendous progress and to day it was safe and sure. Before aviation could develop, as it must eventually develop, there must be a sense of security. Last year in the training of R.A.F. pilots for every fatal accident 93,000 miles were flown. That would compare very favourably with other means of transport.

Will the Air Ministry confirm the statement that 93,000 miles were flown for every fatal accident?

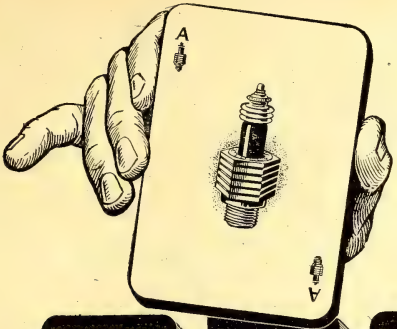
24 T.S. R.A.F. Dinner.

A dinner will be held in London on May 21st for the 24th T.S. R.A.F., Netheravon, 1917-18. All instructors and pupils wishing to attend should write to Lieut. Startup, Birchbank, Christchurch Road, Hampstead, N.W.3.





IN NEWFOUNDLAND.—Above is seen Mr. Raynham's Martinsyde biplane (Rolls-Royce engine) being wheeled out for a trial flight at Quidi Vidi. In the lower picture it is seen getting ready to start. THE AEROPLANE is indebted to Mr. Percy Noël of the "Chicago Daily News," and formerly of the pioneer American aviation paper, "Aero and Hydro," for these and other pictures from Newfoundland.



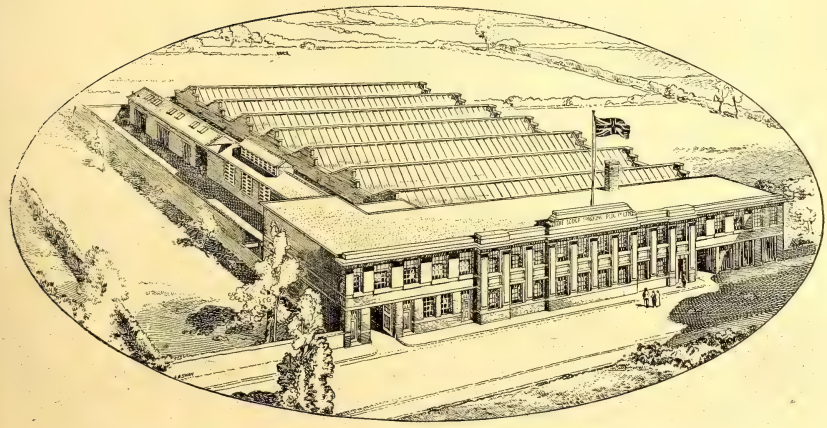
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The WORLD of AERONAUTICS (continued)

Those Doctors Again.

The following Press communiqué has been received from the Air Ministry :—

A special Medical Examination is necessary before a pilot can be granted a licence covering the carrying of passengers or goods for hire or reward.

Applicants should communicate in writing with the President of the Aviation Candidates Medical Board, 9, Arkwright Road, Hampstead, N.W., asking for an appointment, at least 48 hours before the time they desire to present themselves for examination. A fee of £1 1s. will be charged for the examination, which will take place normally between 2 p.m. and 4 p.m. on any day except Saturday and Sunday.

The fee is payable at the time of examination.

If found medically fit a certificate to that effect will be given to the candidate, who should then forward it, together with his application for licence, to the Secretary, Air Ministry (C.G., C.A.).

When first communicating with the President of the Board, candidates should be careful to give their surnames and Christian names, together with information regarding their previous Service (if any) in the Royal Air Force.

Flying over the Battlefields.

From the "Daily Express" of May 18th :—

I learn that arrangements are being made for civilians to view the battlefields of France from the air. Aircraft are being fitted with special cabins that will permit comfortable observation, and will fly as low as safety permits over the Somme battlefield, the Chemin des Dames, and the Ypres salient. This is all part of the programme being arranged by a company which is running "tours de luxe" in the war zone. A member of the Paris Embassy staff has a finger in the pie!

[This was proposed during the first six months of the war by an officer of the R.F.C.—Ed.]

The Handley Page Squadron's R.N.A.S. Dinner.

Will any officers who served overseas with the Handley Page Squadron, R.N.A.S., under Commr. J. T. Babington, D.S.O., R.N., and who wish to attend a Re-union Dinner at the Ritz Hotel on May 28th, please communicate with Capt. H. Mason, R.A.F., Eriskay, Warlingham, Surrey?

59 Squadron's Dinner.

Will any members of the 59th Squadron, B.E.F., wishing to attend a Dinner on Saturday, May 24th, please communicate with Lieut. Wilcox, Worthy Down, Winchester?

49 Squadron's Dinner.

A Re-union Dinner of the 49th Squadron, R.A.F., will shortly be held in London. Will those wishing to attend write to Major Benning, No. 11 T.D.S., Old Sarum, Salisbury, before May 22nd.

The Independent Air Force Dinner.

A dinner will be held on June 14th at the Savoy Hotel at 7.30 p.m. for 8 p.m., for all Officers who served at any time with the Independent Air Force.

All those wishing to attend should communicate with Major W. G. P. Young, Room No. 668, Air Ministry, London, W.C.2, on or before June 1st, enclosing cheque for two guineas. Evening dress or uniform.

Major De Havilland in Spain.

On May 5th Major de Havilland flew from Madrid to Barcelona and back. With a favourable wind the outward journey was made in thirty minutes. The express train takes 15 hours. Attention should be drawn to the fact that the machine Major de Havilland is flying is most probably a single-seater of the fighter type. No big passenger machine could do the journey quite so quickly, and one cannot always count on a following wind. Even so the time taken by air would be considerably less than that taken by the train.

A Warning.

Under the heading "Essential Military Precautions Forgotten in the Treaty,' the "Matin" dwells on the fact that civil aircraft can immediately be transformed into bombing aircraft, and adds :—

"No article forbids the German metal industry, of which we know the power, to construct an army of airships and aeroplanes disguised as commercial aircraft. It is evident we cannot suppress German aviation, or exclude Germany from the great aerial traffic which, within a quarter of a century, will circulate over the world, and the limitation of the number or size of her aircraft would also be inefficacious.

"But the Allies should insist on remaining masters of the air until the day on which Germany gives security for her repentance and pacifism. The air should become the property of the League of Nations, and an air police under inter-Allied auspices could then protect the civilised world from its greatest peril. There are thousands of paragraphs in the Treaty dealing with the military precautions, but the essential precaution has been omitted. As the Treaty has not been signed, there is still time to avert the danger."

Exclusive News.

The New York publication "Flying" often gives exclusive news from Great Britain. The following is an example :—

"London, March 17.—The airship section of the Royal Air Force will not compete in any trans-Atlantic air race, but the two recently launched naval airships belonging to this section will undertake the voyage as a training test when some defects discovered in their trials have been remedied.

"Probably one airship will try to cross between Scotland and Newfoundland by parachute, returning to Great Britain on a non-stop voyage. The other vessel will probably cross by the Southern route, from Africa to Florida.

"The Admiralty officials, it is stated, do not expect that either attempt will be made before May."

The accuracy of the forecast is remarkable, as before May no attempt was made by any airship to cross the Atlantic by parachute.

When Language is Inadequate.

According to a Reuter telegram, Lieut. Ormer L. Locklear, an American aviator who has performed the feat of leaping from one aeroplane to another while in full flight, declares that it is all very simple.

He is reported to have said : "When my pilot is running smoothly at not less than 5,000 ft. I climb down to the axle of the ground wheels under the plane, and sit there and wait for the second machine to fly under me. When it is directly under me and both machines are going virtually at the same speed, I drop about 2 ft. One foot slips instantly under an iron support for an exhaust pipe. Then I grab it with my hands. That's all—if you do it perfectly."

In these pages there recently appeared some photographs of an aviator climbing about a machine in flight, and one was moved to make the comment that the feats indicated "imbecility in excelsis." After reading the above one sympathises with the motor-'bus driver who could not make an effective retort because his opponent had used all the best words.

Two Long-Distance Flights.

Two long-distance flights were made on May 9th by Handley Page aeroplanes. The first machine, piloted by Major Foot, R.A.F., left the aerodrome at Cricklewood at six o'clock, and visited Bournemouth, the Isle of Wight, Portsmouth, and Southampton, landing at Eastleigh at 8.30, after a non-stop flight of about 200 miles. The second machine, with Lieut. H. M. D. Walker, R.A.F., as pilot, left Cricklewood also at six o'clock, journeyed to Cardiff and Swansea, and returned to Bristol, landing at nine o'clock, the distance travelled being about 250 miles.

The Sale of German Aircraft.

According to a report issued on May 12th, General Nudant, on behalf of the Allied Governments, has informed the German Armistice Commission that all sales of German aeroplanes to foreigners are forbidden, and has demanded that immediate steps be taken to put a stop to such sales.

Which seems rather unreasonable, for if Germany is not to sell her products, how is she to pay her War Indemnity?

Unconvincing.

Major-General Seely, Under Secretary for the Air Ministry, speaking at the Iron and Steel Institute Jubilee celebration, May 8th, said : "A better steel was the one thing that would make air travel really safe and efficient. If the manufacturers would produce an engine at one pound per horse-power, or even half a pound per horse-power, he would guarantee that air travel would be made more safe and profitable than any other method."

But would an improvement in the quality of steel allow the designer of aeronautical engines to effect such great reduction in weight? One has one's doubts. Does Major-General Seely imagine that "better steel" would enable designers to cut down the weight of parts by, say, 75 per cent. or more? And is not the term "better" somewhat vague? There are many different grades of steel for different purposes. The steel used for making the hair-spring of a wrist-watch might not be suitable for making exhaust valves for an air-cooled engine, but one cannot say that one grade is "better" than another.

The remark of the genial Scot who said that there is no bad whisky, though some is better than others, is clear, because one presumes that he regarded whisky as useful for only one purpose. He did not intend to burn it in a spirit lamp in order to make tea, or to run a motor-cycle on it. If he had said there is no bad steel, but some is better than others, the remark would have been absurd, unless he stated the purpose to which it was to be applied.

As to the statement that, given a lighter engine, air travel could be made safer and more profitable than any other method, one can only say that it is unconvincing.

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PARIS NOTES

For some time prior to the war M. Robert Peugeot had on offer a prize of 10,000 francs to be awarded to the first man who produced a successful aviette. In order to encourage latent enthusiasm and any promising designs M. Peugeot has notified the Press that his offer still holds good. Regular readers of my notes will be aware that quite a lot of interest is taken in the aviette not only in France, but in Switzerland and Italy, so there is the possibility of the contest becoming international. The prize will be awarded to the first person who raises a machine off the ground by natural physical force—i.e., muscular effort—and who travels a distance of 10 metres.

The Organism of Civil Aviation.

As Colonel Dhé has been replaced by General Duval, it was to be expected that Lieut.-Col. Leclerc should be superseded by an officer of higher rank. Lieut.-Col. Leclerc was appointed Organiser of Civil Aviation in January of this year, and has therefore not had long enough at his work for the results to be immediately apparent. Nevertheless, the Aircraft, and particularly the fast-developing Aerial Transport Industries recognise that they owe their present development solely to his energy. He it was who conceived the idea of creating trunk airways from State resources and dividing up the landing grounds into aerogares, etc., the various routes to be exploited by private companies. The scheme has progressed so well that the Posts and Telegraphs Department have laid before the Chamber a request for another five million francs (£200,000) in order that they may organise and establish four more aerial post lines. As the project has been admitted by the Treasury, who are responsible for the Budget, it is almost sure to receive the approval of the Chamber.

Up to the present the Postal Authorities have been working four lines: Paris-Le Havre, Paris-Lille, Paris-Brussels, and (in course of organisation) Paris-London. Of these four routes, three have been, or will be, taken over by private companies (Paris-Lille by La Compagnie des Messageries Aériennes); there only remains the Paris-London, which will surely be quickly taken up by a private concern, possibly Farman. In view of this the Postal Authorities propose to initiate an airway from Paris to Nice in two stages, one Paris-Lyons with relay machines at Auxerre and Dijon, and the other from Lyons to Nice, possibly with one relay.

Aerial Activity.

The Compagnie des Messageries Aériennes, which is the Bréguet-Blériot-Caudron-Borel combine, are running their daily service to Lille. Packages are carried at a fee of 1.25 fr. per 50 grammes (just over one pound). Tassel, one of their pilots, left Paris for Lille last Tuesday in a snow and hail storm. The Compagnie Francaise de Navigation Aérienne are another new concern, and they have placed the technical direction of the concern in the hands of Lieut. Georges Madon, one of the foremost French aces. Then there is the Compagnie des Grands-Express Aériennes, established by Lieut. Villier and other officers of the French Service d'Aviation: their offices are 3, Rue d'Anjou, Paris. This firm is about to conclude a contract with the Government for the transportation of 150 Bréguet machines from Paris to Casablanca by the overland-and-short-sea route. Fifteen to twenty pilots will be employed. They also propose to start a London-Paris service as soon as conditions allow.

An Aerial Postage Stamp.

The French Postal Authorities propose to charge a surtax of 75 cs. on packets of 500 grammes, 1 fr. from 500-800 grammes, and 1.25 above that weight, on packages or letters carried by aerial post. A special stamp is being printed at the Boulevard Brune Works, designed by M. Léon Ruffe. In the centre of the design is the head of Capt. Guynemer; on the left a view of Issy-les-Moulineaux, the cradle of French aviation; and on the right an aeroplane flying over the Seine. The stamp is to be issued in three colours for the different denominations—black, blue, and red respectively. It will not be issued to the public, but will be affixed to correspondence by the Post Office to show that the proper fee has been paid.

A Reunion of Ministries.

It is possible that France will have an Air Ministry. It is not to be called by that name at present, but as all the weather-cocks are pointing in the same direction everyone is hoping they will stay in the same position. M. Daniel-Vincent will preside over a reunion having for its object the study of "the concentration of all aeronautical services under one direction." M. Daniel-Vincent is a French Deputy and one-time Under Secretary for Aeronautics. At his reunion will be represented the Ministries of War, Marine, Colonies, Public Works, Commerce, Posts and Telegraphs, Finance, and Work.

It will be responsible for:—

1. The placing of orders for and distribution of materials.
2. Organisation in France and her colonies of general trunk airways; a trunk radio-telegraphic system; the centralisation and distribution of meteorological reports.
3. Study of the best means of helping private companies: subsidies to accord them, contracts, etc.
4. Aerial law in all its aspects.
5. The collation of information on foreign aviation.

The Committee of the Chambre Syndicale des Negociants d'Automobiles decided to send a deputation to General Duval on the question of the sudden cessation of work and consequent discharge of aeroplane machine and engine repairers, without notice and without explanation. They demanded that work should be given out equally and that old Government contractors should not be passed over in favour of newcomers.

A League of Pilots.

Last week I mentioned that the "Ligue des Pilotes Aviateurs" had a membership of 1,500; this week it is the turn of "L'Union Nationale des Combattants de l'Air," who claim 1,700 adherents. Its offices are in the same building as the French Aero Club, 35, Rue Francois Premier. All the notable Aces are on the administrative council or holding office. The aims of the Union are to (1) establish contact between all who served with a combatant flying unit at the front, (2) to help members so far as possible, (3) to help them to find appointments according to their aptitude or wishes, (4) to establish a situation-bureau for mechanic-members of the Union. It is an organisation worthy of the support it has already obtained.

The Casualties.

During the first six months of 1918 French aviation sustained cruel losses. Whilst the infantry losses amount to 51 per cent., those of aviation attained 71.3 per cent., divided up between pilots and observers on the front only (i.e., not including accidents elsewhere). The killed were 16 per cent., wounded 25.8 per cent., missing 29.4 per cent. (75 per cent. of the latter are dead). One hundred and sixteen pilots were killed in air fights and 218 in accidents! In the above figures no account is taken of gunners, bombers, or mechanics.

The Goliath's Climb.

The Farman products are well to the fore. On May 5th, at 5.32 in the afternoon, the Goliath left Toussus-le-Noble to attempt the height record with 25 passengers. The machine returned to earth at 7.14 p.m., having risen to a height of 5,100 metres (about 15,500 ft.). The climb took 1 hr. 25 mins., and the descent 25 mins. Twelve degrees of frost (Cent.) were registered at the highest point. Capt. Cassin, of the French Aero Club, registered it as a record. Well over four tons were carried, as will be seen by a glance at the following:—

25 men at 130 lbs. each	1,625 kilos.
Net weight of machine	2,000 ,,
Petrol	350 ,,
Oil	30 ,,
	4,005 ,,

By means of a very simple calculation "L'Auto" is at pains to rejoice over the fact (*sic*) that the Goliath lifts 6 ks. 600 gr. per h.p., whereas the Handley Page only lifts 4 kilos per h.p. Their calculation would seem to be very loosely made, especially in view of the fact that they rely on Boussoutrot's statement that the engines were only run at half-speed.

The comparison is interesting of the last three height records on the Goliath:—

Apr. 1st— 5 passngrs., 6,300 m. in 1 h. 5 min., frost 40° (Cent.)
Apr. 3rd—14 passngrs., 6,200 m. in 1 h. 5 min., frost 31° (Cent.)
May 5th—25 passngrs., 5,100 m. in 1 h. 25 min., frost 12° (Cent.)

F. T. N.

Italian News.

Christenings.

The powers that rule have consented to a general wish that the late Major Angelo Berardi's dirigible may be called by his name. The Contocelle Aerodrome is to be known as the Francesco Baracca Aerodrome. A number of influential people went out there from the capital the other day for the re-naming.

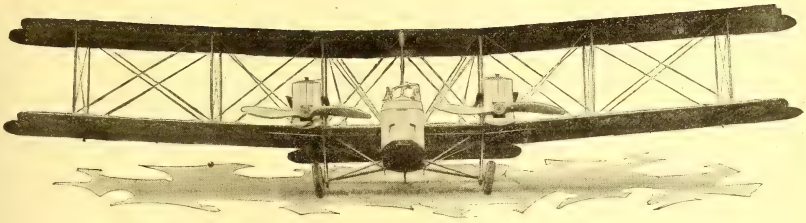
A Resignation.

The resignation of General Monis from the post of Director-General of Aeronautics, which occurred some weeks back, is being discussed. It is said that he could not obtain sufficient funds to carry out what he considered essential for the wellbeing of the Italian aero trade. Major Siebert is to succeed him in the post, and also as representative of Italian interests at the Allied International Conference on Aerial Transport at Paris.

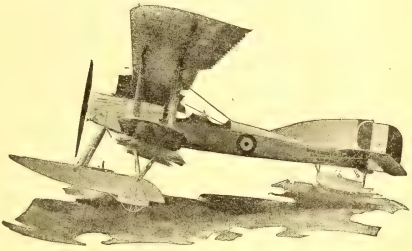
A Route to be Avoided.

The unnecessary crossing of the Alps might well be forbidden nowadays when everybody knows it is possible. Perhaps the Paris Conference will decide which is the more suitable route from that city to Italy. It appears that the Riviera coast route is the official Italo-French Government way to be used by their postal Pilots.—T. S. H.

A UNIQUE EXPERIENCE







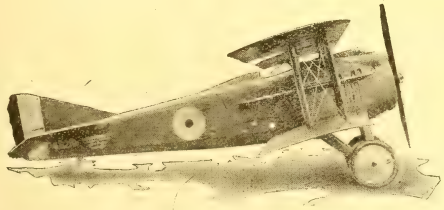
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BRAINS v. SUPERFICIAL SMARTNESS.

A Reply by Roger Bayons.

What is discipline? The means employed to obtain co-ordination and precision of action in large bodies of men working for a common object. In its proper application it prevents duplication of effort, gives self-reliance to all under its spell and inculcates in all ranks the principle that success in war is gained only by prompt obedience to orders given by higher authority.

It is at times a misunderstood word. There are those who read into discipline merely a parade smartness in which the satisfaction of the eye covers all the defects that might be revealed to the brain if that rare organ were employed with skill. Precision of movement when on the square and a close imitation of the habits and virtues of an automaton are not the only essentials necessary in the evolution and growth of discipline.

When in earlier times the races of the world fought with careless joy, discipline was a thing unknown. Each fought as an individual and attained success in accordance with his prowess. Success or defeat to his side was, however, decided by other factors, of which Fortune was not the least. Then in due course came men with orderly brains and discipline began to grow in some armies. A common movement on the simplest lines took the place of the disorder attendant on individual effort. The Romans, orderly and well trained, swept the earth, defeating with entire impartiality the feeble savages of Eastern Europe and the Teuton giants of the North. They proved that discipline counted for many battalions in war, and that small armies well trained might with impunity engage in action vastly superior hordes of untrained savages. And so through history the principle has remained unaltered.

It is, of course, idle to suggest that mechanics in such a service as the Royal Air Force should be expected to carry out the complicated manœuvres of a Guards' parade ground with efficiency and skill. They are not intended for that part of life. That is the duty of the infantry. But it can at least be expected that they should be smart in appearance—they cannot always hope to be clean—and that they should carry out their orders with swift obedience and precision. They are not expected to assemble engines by numbers nor can much ceremonial be carried out in an aeroplane hangar.

The "Snipe" in his article directed against either brains or superficial smartness—I am not sure which: both are dangerous—quotes many instances in his experience of the Royal Air Force of time wasted and work delayed by an over-indulgence in the manners and methods of the parade ground.

He speaks of a serjeant-major who addressed his men with vigour, if not always with courtesy. He was in the habit of calling them "b—dy rabble," much to their annoyance. But nevertheless it was probably an accurate description. Nor is a station similar to "a school for young ladies." But most of his instances refer to the vagaries of an O.C., who, even though an infantryman, was certainly unfitted to command men. Possibly his regiment had discovered this at an earlier date and had passed him on to a newer service more tolerant of inefficiency. If the "Snipe's" account is unexaggerated, the station to which he was attached was certainly an haven of rest for technical officers, as their men were always engaged on non-technical work.

But there is a vast difference between this manner of existence and a well-disciplined station doing that work for which it was formed.

Even mechanics, however Bolshevistic their ideals may be, should go "on the square" in the ordinary way for a sufficient period to teach them self-respect and their duties to higher authority. After that, with the exception of such daily parades, probably not more than two, as are necessary, the mechanic might revert to type and be as dirty and as happy as he pleased. Nevertheless, he must do his fair share of the work as a part of a unit.

Technical officers are fond of saying that private engineering firms get more work done in a given time than does the Army. No greater fallacy ever existed. When one deducts the time allotted to meals, necessary and unnecessary, to criticisms or eulogies on the shop stewards, and to the general dissemination of mild revolutionary principles, the number of hours' honest work done by the average civilian mechanic is surprisingly small. The day's work done by Service mechanics is at least thorough and no time in the working day is wasted.

"The Snipe" says in his fourth paragraph that an abnormally smart airman is invariably a "wash-out" as a mechanic. I deny this flatly and from personal experience of the Service mechanic as a class. He may not look like a mechanic because he is not habitually dirty and has acquired a high degree of self-respect, but on the average his work will be as clean and well finished as he is himself.

Clearly one cannot expect discipline if inefficient officers are left in charge of stations, but if officers of proved ability are employed and are supported by junior officers properly trained and educated in the ways of the Service, it is possible to inculcate the proper spirit. That station will then be more efficient than others in which discipline is at a discount and the methods of engineering are used as a substitute.

THE FLIGHTS TO AND FROM MADRID.

The four-engined Handley Page bomber F 7139 left Ramsgate on May 6th for Madrid with six persons on board. The machine landed at Biarritz on the same afternoon, but was held up for a few days by adverse weather conditions. The flight to Madrid was made on May 11th. The machine was commanded by Major C. H. Darley, D.S.C., D.F.C., R.A.F., with Lieut. Kilburn, R.A.F., as second pilot, and Lieut. Murray, R.A.F., as observer. Three mechanics were carried.

Three other aeroplanes also left Biggin Hill aerodrome on May 7th to fly to Madrid. They were two D.H.4's, one piloted by Lieut.-Col. W. D. Beatty, R.A.F., the other by Capt. Square, R.A.F., and a Bristol Fighter piloted by Major Payne, R.A.F. All these machines were fitted with Rolls-Royce engines. Colonel Beatty crossed the Channel between Beachy Head and Fécamp, and Tours was reached at 10.57. Leaving Tours at 1.50, Pau was reached at 4.40. Between London and Pau there was good average flying weather. Starting from Pau at 6 p.m., he encountered a storm amongst the mountains above San Sebastian, and he was obliged to return, finishing the journey the following day. Lieut. Jeffrey went as passenger with Col. Beatty.

Major Payne, on the Bristol Fighter, landed in the province of Soria on May 8th. It is stated he is the first British aviator to enter Spain by air.

A telegram from San Sebastian reports that Captain Square and Lieut. Anderson, R.A.F., his observer, in the second "D.H.4" machine, landed at Hendaye (on the French side of the Spanish frontier) at 6.30 p.m. on May 9th, having left Tours at 10.5 a.m. and passing over Pau at 6.5 p.m. The aviators arrived in Madrid at 7.40 on the same day, landing at Cuatro Vientos Aerodrome.

Col. Beatty, with Lieut. Jeffreys as observer, accomplished the return flight on May 12th in less than 12 hours in a D.H.4 machine. They left Madrid at 6.15 a.m., and arrived at Kenley Aerodrome at 6.10 p.m., stopping on the way at Pau and Tours for petrol, and covering a distance of 987 miles.

Lt.-Col. Beatty is one of the pioneer military pilots of the King's Service. When a Sapper officer he took his certificate (No. 89) on an Avro biplane on May 30th, 1911, at Brooklands. As he is 35 years of age and has been flying for eight years he is a standing disproof of the idea that flying is a young man's game to be played only for a year or two.

Colonel Beatty has had a distinguished war career. He went to France with the first four squadrons, and after a year or so of active service he was brought back to assist the production of aircraft. In 1917 he deliberately took a step down in rank so as to command a squadron in the field. Again he was brought back, this time to put practical sense into the Technical Department, and towards the end of the war he again escaped from England to go on active service. Like so many of the best people in the R.F.C., Col. Beatty is an Irishman, and of the same family as Admiral Beatty.

A FLIGHT FROM PARIS TO COPENHAGEN.

Lieutenant Krause Jensen, the French military aviator, flew from Paris to Copenhagen in eight and three-quarter hours, a non-stop flight of 683 miles. Lieutenant Jensen flew a Breguet biplane, and was accompanied by Lieutenant Sabouret. They were carrying despatches from Paris. The trip was made *via* Antwerp, Helgoland Bay, and Jutland.

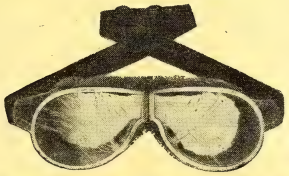
ANOTHER RECORD CLAIMED.

M. Sadi Lecomte, the French aviator, flying a monoplane of an unstated type, climbed to 8,200 metres in one hour thirty minutes on May 9th. This, it is claimed, has broken the previous record of July 14th, 1914, made by the Austrian aviator, Herr Oelerich.

AN APPOINTMENT.

According to the "Daily Express," among the recent appointments to H.M.S. "Lion" (flag of Vice-Admiral Sir Roger Keyes) is that of Lieut.-Commander Richard Bell Davies, V.C., D.S.O., R.N. Lieut.-Comdr. Davies was in the pre-war R.N.A.S. At the outbreak of war he served in Flanders and Gallipoli. He resigned his commission in the Air Force some months ago, and returned to the Royal Navy.

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HATS, BRASS, TO ACHIEVE.

By "The Snipe."

Some men are born to brass hats, some achieve brass hats, and some have brass hats thrust upon them.

But all are not bold who glitter.

Having given some study to the subject, one has come to the conclusion that brass is for the brazen.

Let us consider the three methods of attaining brassiness, and in order to do so let us translate the language of Shakespeare into the literary style of the Service. Thus :—

A. Hats, brass, to be born to. . . . This method involves little more than a careful choice of parents

B. Hats, brass, to achieve. . . . See Appendix X. Para. 11. Sub-para. C.

C. Hats, brass, to have thrust upon. . . . This does not occur in actual practice.

One may proceed, therefore, to B.

Appendix X. Para. 11, Sub-Para. C, Hats, Brass, to Achieve.

Promotion is by merit only. This means that the person who desires a "hat, brass, one, officer for the use of," must show merit. It does not imply that he must *have* merit, but merely that he must *show* it. Better results are often achieved by showing the result of some other person's work than by trying to do the work oneself, for it must always be remembered that the more work one does the more chances one has to make mistakes, and the less time one devotes to work the more opportunities one has to criticise other people.

In the Service there are two classes : the strafer and the strafed. It is the latter class that does the work; the former too often gathers the resultant honours.

I remember very vividly the case of a very painstaking officer. He was so unfortunate as to accept delivery of certain metal from an aviating Hun in 1915. The surgeons considered that he would have a better chance of recovery with one leg than with two, but he thought he would rather have two legs in the grave than leave one in the hospital. Consequently, he suffered from blood-poisoning and nearly qualified for wings for the second time.

But not quite.

Eventually he recovered and was passed by the Medical Board as fit for ground duties.

Enthusiasm only Equalled by Ignorance.

Now some flying officers when they cease to fly lose interest. They appear to consider a ground job beneath their dignity, and as good work cannot be done unless the heart is in it, they perform their duties very unsatisfactorily indeed. But this one was not of the sullen type. As he was not allowed to fly, he threw himself heart and soul into his new job with an enthusiasm that was only equalled by his ignorance. He toiled from reveille until the small hours when wiser men are calculating their losses at auction bridge. Never was there such a glutton for work, and, consequently, he made mistakes. When the mistakes were discovered, he had nobody to blame. Thus he broke one of the fundamental principles.

Compared to Sodom and Gomorrah.

His job was that of forming a new station somewhere in England. When he arrived at the appointed place he found himself in a land that would have made Sodom and Gomorrah, at the time when they were enduring the historic air raid, seem desirable resorts.

This place which had been chosen as the site of an aerodrome consisted mainly of furze bushes and small trees. Three or four times a week the furze bushes caught fire : which would have been an advantage if the authorities had not consigned to the Station a number of aeroplanes and a vast store of bombs before the furze had been removed.

A number of men had been drafted to the Station, but there were no tents. In these days aeroplanes were usually delivered in large cases which were on no account to be destroyed or cut in any way. The officer in question used these cases as huts for his men. But no sooner had he got his Ack Emmas under shelter than a begilded Inspector arrived, and, in the name of sanitation, demanded that windows of a stated size should be cut on opposite sides of the cases in order that a current of air might pass through.

Two days later there arrived a letter from H.Q. saying that it was not understood why the regulations regarding the ventilation of huts had not been complied with, and requesting that the name of the officer responsible should be sent. In the meantime the windows were to be cut.

The order was obeyed and two days later there arrived another letter from H.Q. stating that the aeroplanes sent had been dispatched in error, and that they were to be dismantled, re-packed in their cases, which must be intact, and returned.

These were only a few of the troubles.

In course of time some tents arrived. The fact that they bore such names as "Somme View," "Earwig Villa" and "Mosquito Mansions," indicated that they had been to the Front, and when the first rainstorm broke it became apparent why they had been sent home.

Other inspecting officers arrived and condemned the tents, but did not say how they were to be replaced, and H.Q. asked why the men were not accommodated in the huts (cases, aeroplane), which had been returned according to order. The name of the officer responsible would be sent, and this was to be regarded as urgent.

But the officer in question was not broken—yet. Though H.Q. kept him occupied for the half of every day on the work of explaining what he had and had not done the day before, he steadily overcame one difficulty after another.

His cooking arrangements, boilers and ovens made of petrol and oil cans are still mentioned with respect by fellow-officers, but H.Q. desired to know by what authority the cans were converted to culinary uses, and again demanded that the name of the responsible officer be sent. This was to be regarded as being more urgent than any other matters whatsoever. A Brig.-General would visit the station to inspect.

The Brig.-General's Disapproval.

The Brig.-General came, talked spaciously regarding discipline, the necessity of obeying orders and regulations to the letter, and the vital importance of saluting smartly. Having lived most of his life in comfortable old-established purely military Stations where men on the Peace establishment lived in brick-built, well-warmed barracks with whitened steps and window-sills, he did not approve. He hinted that disciplinary action might be necessary with regard to the cans and the aeroplane cases, and demanded a victim.

Observe how the officer in question was sinking deeper into the purée. He had done the work himself.

The Brig.-General said that it would be necessary to send a Staff officer to inspect the technical accounts, and another to investigate the method of accounting for Q.M. stores.

As the weather had become warmer, and as a visit to the Station involved a pleasant motor-car run from London, these officers duly arrived. They were both elderly Majors, and as one had been a clerk in an old-established Bank, and the other in an Insurance Office before the war, they were obviously competent to deal with the accounting for oil cans and engine spares dumped on a piece of waste ground.

But in these matters the ex-flying officer had them cold, simply because—having no offices, and having, so far, nobody on the Station who knew anything about the sinuosities of R.F.C. accounting—he had no books, forms or tally-cards to show.

The Majors said they would have to report, so once more a letter arrived from H.Q. saying that "It was not understood," and that "action would be taken."

The Hard Work almost Finished.

But by this time the hard work that had been done in the intervals between the visits of inspecting officers, was beginning to show results. The men had tents, and the means had been found of making these waterproof by the time the order arrived to return them to store. The men were well fed and cheerful. Two hangars had been rigged, and enough ground cleared to enable machines to leave the floor and return to it.

But, concurrently, those reports of inspecting officers were percolating through department after department at H.Q. annotated "Passed to you, please," "For your attention and necessary action," "For your remarks, please," "Not this department. Passed to X.Y.Z." "Referred back. Please note Minute XIV."

And so on.

Possibly not fewer than one hundred of the Staff were concerned in the slaughter of the Strafed—*id est*, the unfortunate, who was trying to do the work.

And at last the blow fell.

There arrived at the Station another officer to take command. He looked, saw that the hard work had been done, and, having some knowledge of inspecting officers, proceeded to supply the desired eye-wash. He placed stones round the tents and whitewashed the stones, he bought geraniums and had them planted round the Orderly Tent, and he had an R.F.C. flag made. He had the fire extinguishers painted a violent red, and got a local sign-painter to write FIRE in corpulent letters on red boards.

Once more the Brig.-General came, and the new O.C. provided the right lunch and made a personal matter of providing flowers for the table.

Also, there was wine.

And after the wine the whitewashed stones, the geraniums (or should it be gerania?), the flag, and the ardently coloured fire extinguishers did the work they were intended to do. The Brig.-General was delighted, and the result was that Lincoln, Bennett and Co. received an order for a perfectly good brass hat for the O.C. who knew the art of mixing eyewash.

Is this perfectly untrue picture too vivid in its colours, *mes enfants?*

Dim them if you will, but there are some among you who will feel no desire to view them through smoked glasses.

AIRCRAFT IN PARLIAMENT

The following written answer was given on May 5th :—

INTERNATIONAL AERIAL NAVIGATION.

Mr. ROWLANDS asked the Under Secretary of State to the Air Ministry whether a Report of the Proceedings of the Commission on International Aerial Navigation has been published; and, if so, where can it be obtained?

Maj.-Gen. SEELY: The sessions of the Commission in question are still proceeding, and no report has been as yet published

* * *

The following oral answers were given on May 7th :—

ROYAL AIR FORCE (PAY)

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry whether any new rates of pay for the Royal Air Force are contemplated; whether the question has yet received Treasury or Government approval; and whether it can be anticipated when the new rates of pay will be published?

The UNDER SECRETARY OF STATE FOR AIR (General Seely): Revised rates of pay for officers and men of the Royal Air Force are being considered. Until the detailed rates have been considered by the Government in conjunction with those for the other Services, no definite date for their publication can be stated, but I am aware of the importance of an early settlement

CONTROLLER OF CIVIL AVIATION.

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry whether his proposals for the staff of the Controller of Civil Aviation have in any way been subject to revision from the Treasury; whether he will publish what his original proposals were; and what section of the staff has been omitted on account of Treasury pressure?

General SEELY: It would be contrary to precedent and to the public interest to make communications necessarily passing between the Treasury and other Government Departments with regard to expenditure the subject of discussion in the House.

TIMBER FOR AEROPLANES.

Mr. REMER asked the Under Secretary of State to the Air Ministry whether the present advisers as to the timber required on aeroplanes are the same officials who sanctioned the use of cypress during the War; why the many warnings of practical timber merchants as to the use of this wood were disregarded; and what was the cost of scrapping machines made of this wood after the use of cypress had been prohibited?

General SEELY: The answer to the first part of the question is in the negative. Considerable changes in the personnel of the Technical Department have taken place owing to the return of officials to their civil occupations. As regards the second part of the question, I would refer the hon. Member to the answer given to him on this subject on the 1st instant. I am endeavouring to obtain details as to the cost of substitution of other woods for cypress in the machines concerned and will communicate with the hon. Member as soon as possible

The Replies to the following Questions were not received in time for inclusion in the Official Report yesterday.

COMMERCIAL AEROPLANES (HUMBER).

Lieut.-Commdr. KENWORTHY asked the Under Secretary of State to the Air Ministry why the landing-place for commercial aeroplanes in the Humber district has been chosen at New Holland, on the opposite side of the river to Hull, and whether he will consider the early establishment of a commercial aerodrome on the north side of the Humber near to Hull?

The UNDER SECRETARY OF STATE FOR AIR (Maj.-Gen. Seely): New Holland was selected as the aerodrome best suited in the neighbourhood of Hull for the combined needs of civil and military aviation. As civil aviation develops it is probable that its interests may require another site, and if so, the Air Ministry will be very ready to reconsider the matter.

Lieut.-Commdr. KENWORTHY: Is the right hon. gentleman aware that that is half an hour from Hull across the River?

Maj.-Gen. SEELY: Oh, yes; I am well aware of that; but it was the first available site, so we selected it. If at a later date it is desired to change, an officer of the Air Force will be sent to investigate.

Lieut.-Commdr. KENWORTHY: Will this station be the aerodrome from which to fly across the North Sea?

Maj.-Gen. SEELY: I cannot say that without notice.

BRITISH COMMERCIAL INTERESTS—SOUTH AMERICAN REPUBLICS

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry whether he is aware that the French Government are supplying surplus aircraft to the South American Republics; and whether action is being taken to ensure that British commercial interests receive adequate furtherance in these areas?

Maj.-Gen. SEELY: I am informed that the French have sent a certain number of aeroplanes to one of the South American Republics. With regard to the second part of the question, facilities have been granted to various firms who were desirous of sending their representatives to South America, and these representatives are now in various parts of that continent. In addition, fully equipped missions are about to be sent to various countries.

ROYAL AIR FORCE—COLONIAL CADETS.

Mr. JOYNSON-HICKS asked the Under Secretary of State to the Air Ministry (1) how many Colonial cadets were in training at the date of the Armistice; and how many have received the gratuity and the uniform allowance of £50; and (2) what is the position of Colonial cadets who have put in for a deferred passage; and whether they are able to draw their allowance for kit, etc., in the meantime?

Maj.-Gen. SEELY: I propose to reply to these questions together. As a rather long statement is required to make the position clear, I propose, with my hon. friend's permission, to circulate the answer in the Official Report

The following is the Answer referred to :—

The number of Colonial cadets in training with the Royal Air Force at the date of the Armistice was about 5,187.

Overseas cadets who accepted deferred repatriation and were demobilised before February 15th, 1919, will be granted honorary commissions in the Royal Air Force, and the same outfit allowances as those given to Imperial cadets, which are as follows: £50, less the value of any issues in kind, to those cadets who qualified as observers or passed qualification "B" before January 1st, 1919

Those cadets who did not so qualify will be reimbursed for expenditure incurred on account of outfit up to a limit of £35, less the value of any issues in kind. Overseas cadets who accepted deferred repatriation after February 15th, 1919, will be given temporary commissions in the Royal Air Force from that date until the date of their demobilisation and an outfit allowance of £50, less the value of any issues in kind. A large number of cadets, in anticipation of being commissioned, purchased outfit and signed orders on Messrs. Cox and Company authorising them to pay the bills incurred from the outfit allowance which would become due to them on being commissioned. The amount of these orders will be deducted from the amount of the outfit allowance in each case.

As regards the issue of the additional pay, outfit allowance, etc., to these cadets, as well as to the other Overseas cadets who did not accept deferred repatriation, it has not been possible in the time available to obtain all the required information and to effect the necessary adjustments in the cadets' accounts to arrive at the balance that may be due to them, but this will shortly be accomplished. Many of the cadets concerned are paid by the Dominion Forces or have been returned to the Dominion Forces for repatriation, from whom nominal rolls are being obtained giving the necessary information for calculating the amount of additional pay and outfit allowance to which these cadets now become entitled. In the meantime substantial advances on account of pay and outfit allowance have been made to cadets prior to embarkation, and the balance of their accounts will be remitted to them as soon as possible.

Mr. BILLING: Will the right. hon. and gallant gentleman give his personal attention to the question of the payment of these cadets, and the various other ratings? Is he aware that on about five different occasions during the war the uniform was changed, and this heavily penalised the poorer cadets?

Maj.-Gen. SEELY: I have given personal attention to the matter, and will continue to do so. It is a difficult question. But I think the answer I will circulate will show that a good deal has been done

MAJOR BATCHELOR'S DEATH.

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry whether he will state the official number of the Handley Page aeroplane on which Major Batchelor, Royal Air Force, was killed at Andover; and whether it was one of the machines which had been left in the open at Hendon aerodrome for so long?

Maj.-Gen. SEELY: The official number of this machine was F 3748. It had not at any period during its stay at Hendon been stored in the open

LIEUTENANT MARS.

Mr. BOTTOMLEY asked the Under Secretary of State to the Air Ministry whether, as the result of the further inquiries into the circumstances which led to the premature announcement that Lieut. Mars, Royal Air Force, was missing, he can say in what remote part of France the airman descended, when the news of his safety was received, and why it was withheld from the public until a question was put in the House; whether, in fact, Lieut. Mars had been seen flying over the North Sea; whether he was at the Brussels aerodrome during the time of the alleged flight; and, if so, who is responsible for the premature publication of his relatives and for the expense of sending destroyers and seaplanes to scour the North Sea for his body?

Maj.-Gen. SEELY: I have ordered a Court of Inquiry into this case. Perhaps my hon. friend will postpone his question until the finding reaches me

Capt. WEDGWOOD BENN: Was this machine carrying wireless at the time of the flight?

Major-Gen. SEELY: That I do not carry in my mind

Mr. BOTTOMLEY: In what remote part of France did the boy land?

Major-Gen. SEELY: I did say in a remote part of France, but I find it is not so remote. As my hon. friend will remember, he gave me no time to prepare an answer. He did not put his question on the Paper. I gave him all the information I could get. Meantime I had ordered an inquiry, and as soon as I get the result of it I will let him know. It is the case that the boy is alive and well. Unfortunately, a good deal of public money was wasted. I will find out the reason

Mr. BOTTOMLEY: As a matter of fact did the boy leave the aerodrome at all?

Major-Gen. SEELY: As a matter of fact, yes; but he came back to a different one.

Mr. MANVILLE asked the Secretary of State for War whether he is aware that dissatisfaction exists as to the steps which are being taken by the Air Ministry to ascertain the fate of missing airmen; and whether any steps are being taken to press the German authorities to inquire more thoroughly from their Army medical service for further lists of British wounded?

Major-Gen. SEELY: I fully sympathise with the anxiety felt upon this matter by relatives and friends of missing airmen and can assure my hon. friend that every step likely to produce useful results is being taken by the Air Ministry. As regards the second part of the question, I would refer my hon. friend to an answer given by the Secretary of State for War to the hon. Member for Stratford on April 30th.

ROYAL AIR FORCE—BONUS.

Lieut.-Col. MALONE asked the Secretary of State for War whether Royal Air Force officers and men who have not yet been demobilised and who are not volunteers for the Army of Occupation are receiving the increased rate of pay from February 1st; whether he is aware that temporary naval officers of the Royal Naval Volunteer Reserve who are in an analogous position are receiving all the benefits referred to, and whether he will take steps to put the pay of such officers of the Royal Air Force on an equal footing?

Major-Gen. SEELY: Full bonus is being given in all cases from May 1st. The cases in which it may be given in arrear to officers and men who are in course of demobilisation, but have not been demobilised on May 1st, are under consideration. An early decision will be given.

WOMEN'S ROYAL AIR FORCE.

Lieut.-Col. MOORE-BRABAZON asked the Under Secretary of State to the Air Ministry what is the policy to be adopted as to the continuation or otherwise of the Women's Royal Air Force; whether he is aware that many drivers, after two years of successful driving, are being dismissed as incompetent and men with no experience at all taken in their place, and will he take steps to put a stop to this practice?

Major-Gen. SEELY: The question of the continuance or otherwise of the Women's Royal Air Force as a part of the permanent Royal Air Force has not been decided. No women drivers have recently been dismissed for incompetence, but a certain number have been replaced by men as men have become available for work for which they are thought to be more suitable than women.

* * *

The following oral answer was given on May 8th :—

MISS DOUGLAS-PENNANT.

Brig.-Gen. Sir OWEN THOMAS asked the Prime Minister whether, before Miss Douglas-Pennant's dismissal, a strict inquiry was made into alleged complaints against her; if so, whether Miss Douglas-Pennant

and her chief, Major-General Sir Godfrey Paine, were aware of such inquiry; and if he will inform the House whether Miss Douglas-Pennant was given an opportunity of hearing and answering the charges against her.

The SECRETARY OF STATE FOR WAR (Mr. Churchill): I have been asked to answer this question. I can add nothing to the full statement which I made on March 13th in the Debate on the Air Force Estimates as to the circumstances in which Miss Douglas-Pennant's appointment was terminated.

Sir O. THOMAS: I should like to ask the right hon. gentleman whether he is aware that a Member of this House was officially informed by the Secretary for the Air Ministry that such an inquiry was held?

Mr. CHURCHILL: I said that I can add nothing to what I have already said in Debate, but I would remind my hon. friend that I expressed my willingness to publish the correspondence which has taken place on this subject if I were pressed to do so by those who are acting for Miss Douglas-Pennant.

Lieut.-Col. MALONE: Is the right hon. gentleman aware that Sir William Robertson, Secretary of the Air Ministry, has endeavoured to influence the opinion of Members of this House with regard to this case, and does he consider that is proper work for this official?

Mr. CHURCHILL: I am not aware of anything of the sort, and I do not know what "influencing opinion" means. It is certainly not proper to bring up such a matter in relation to a question to which it has no reference.

Sir O. THOMAS: Will my right hon. friend inquire whether such an inquiry has been held?

Mr. CHURCHILL: No, Sir; as I say, I have been conducting a correspondence with this lady on the subject of an inquiry, and I am quite prepared to lay the correspondence on the Table if her friends desire it to be laid.

ROYAL AIR FORCE—PARACHUTES.

Mr. CLOUGH asked the Under Secretary of State to the Air Ministry whether his Department is, in view of accidents, devoting special attention to the feasibility of providing all aeroplanes with parachutes; and whether he can make any statement on the subject?

Major-Gen. SEELY: Experiments in the provision of parachutes for aircraft are being pressed on, and considerable results have been attained. The hon. Member can rest assured that all possibilities in regard to the use of parachutes will be explored by the Air Ministry.

AIRCRAFT MANUFACTURING COMPANY.

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry whether he will state the number of applications which have been made by the Aircraft Manufacturing Company and allied companies under the control of Mr. Holt Thomas for the services of important officers or officials from the Royal Air Force; whether he will state the names of those officers or officials who have been released and the positions which they hold in the company; and whether he is aware of any Government official or officials who hold interests in the Holt-Thomas group?

Major-Gen. SEELY: No application has been received by the Air Ministry from the Aircraft Manufacturing Company for the services of officers serving in the Royal Air Force or the Air Ministry. Two senior officers of the Royal Air Force and one official of standing have joined or are joining the company after terminating their connection with the public service, but I am not aware of the positions offered to them. As regards the third part of the question, I have no information.

SURPLUS AEROPLANES.

Lieut.-Col. MOORE-BRABAZON asked the Under Secretary of State to the Air Ministry whether he will arrange with the Treasury that the Disposal Board carry out the recommendations of the Civil Aerial Transport Committee with regard to the selling of aeroplanes at a reduced price (Appendix IV., paragraph 10, Sub-section B) to substantial companies, with a view to helping commercial aeronautics from a national point of view?

Major-Gen. SEELY: The recommendation referred to is one which with other cognate questions is at present receiving the close attention of the Air Ministry.

DEMOBILISATION (DEFERRED PAYMENT SYSTEM).

Major HENDERSON asked the Secretary of State for War whether the deferred scheme of payment on demobilisation for men of the Royal Air Force applies to men stationed with the British Expeditionary Force; and, if so, whether he is aware that some Royal Air Force demobilisation officers with the British Expeditionary Force are not aware that this scheme exists?

Major-Gen. SEELY: The Deferred Payment system has now been cancelled as it has served its purpose. It was not applied to men demobilised from abroad; all such men were (and are being) dealt with under the ordinary procedure.

ATLANTIC FLIGHT.

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry whether the prospective Atlantic fliers were recently interrogated by the Air Ministry as to their reasons for delay in crossing the Atlantic; and whether he will state the general policy of the Government towards this flight?

Major-Gen. SEELY: The answer to the first part of the question is in the negative. Far from urging on the attempt the attitude of the Air Ministry has been, and is, to enjoin caution upon those engaged in this enterprise. The officers who are attempting the flight are not under the control of the Air Ministry, but nevertheless every possible information has been furnished to them and every assistance given with regard to navigation and wireless instruments which can make the venture safer. I may be allowed to add that the record of fearless endurance of everyone of the British competitors is such that they can well afford to decide on the practicability of the flight without fear of cavil.

DANGEROUS FLYING.

The following is taken from the "Daily Express" of May 12th. Comment is unnecessary:—

An unfortunate incident occurred at Hounslow Aerodrome on Sunday afternoon.

Shortly after a "Blackbird" machine had reached Hounslow from Gosport and started again for Leeds, a machine appeared over the aerodrome, apparently in distress. People waiting their turns for flights felt much alarm, some retiring under cover to avoid witnessing the inevitable accident.

Rockets were sent up from the ground, adding to the sense of alarm, and all flying was suspended.

The machine did not crash, however. It landed, in obedience to the orders conveyed by the rockets, and the pilots, military officers from Kenley, were put under arrest for dangerous "stunting" at low altitudes.

Flying then restarted.

THE TRANSATLANTIC COMPETITION.

The Atlantic flight competitors are still delayed by adverse weather, and there is little news to report. The Handley Page biplane arrived at St. John's on May 10th. Three American flying boats left Rockaway Naval Air Station for Halifax on May 8th, but only two of them arrived, the third, N.C. 4, being forced to alight off the Maine coast with engine trouble.

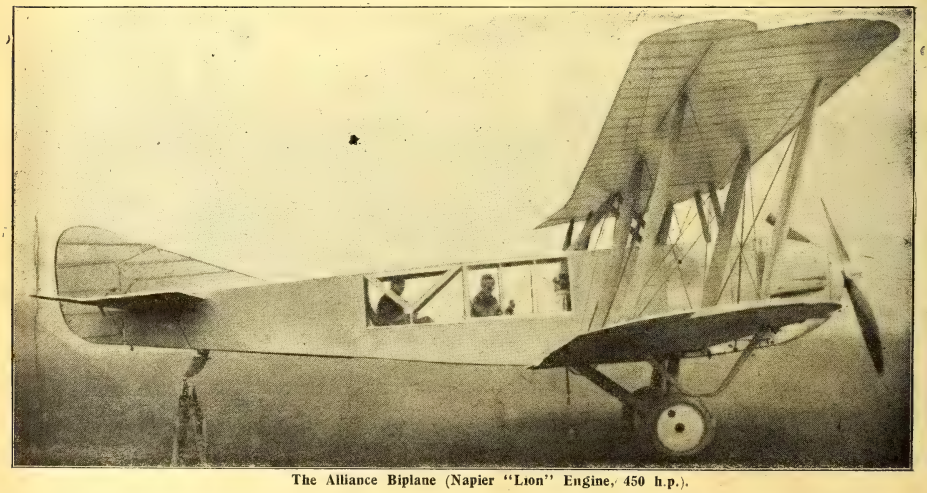
A New Entry.

Boulton and Paul, Ltd., of Norwich, have entered a second machine for the competition which is stated to be in all respects similar to their first entry.

The Alliance Machine.

Some details of the Alliance entry were announced on May 10th. The machine is a biplane designed by Mr. J. A. Peters, the pilot. The navigator is Capt. W. R. Curtis. The following are said to be official figures:—Span, 53 ft.; overall length, 33 ft. 6 in.; plane area, 700 ft.; total weight, 7,400 lbs.; useful load, 4,800 lbs.; petrol, 500 gallons; oil, 50 gallons; flying range, 3,000 miles; maximum speed, 140 m.p.h.; landing speed, 45 m.p.h.; engine, Napier "Lion"; horse-power, 450.

It is understood that the American airship C.5, now at Montauk Point, 110 miles from New York City, will leave during the week for Trepassey. There is a possibility of her making the voyage to the Azores.



The Alliance Biplane (Napier "Lion" Engine, 450 h.p.).

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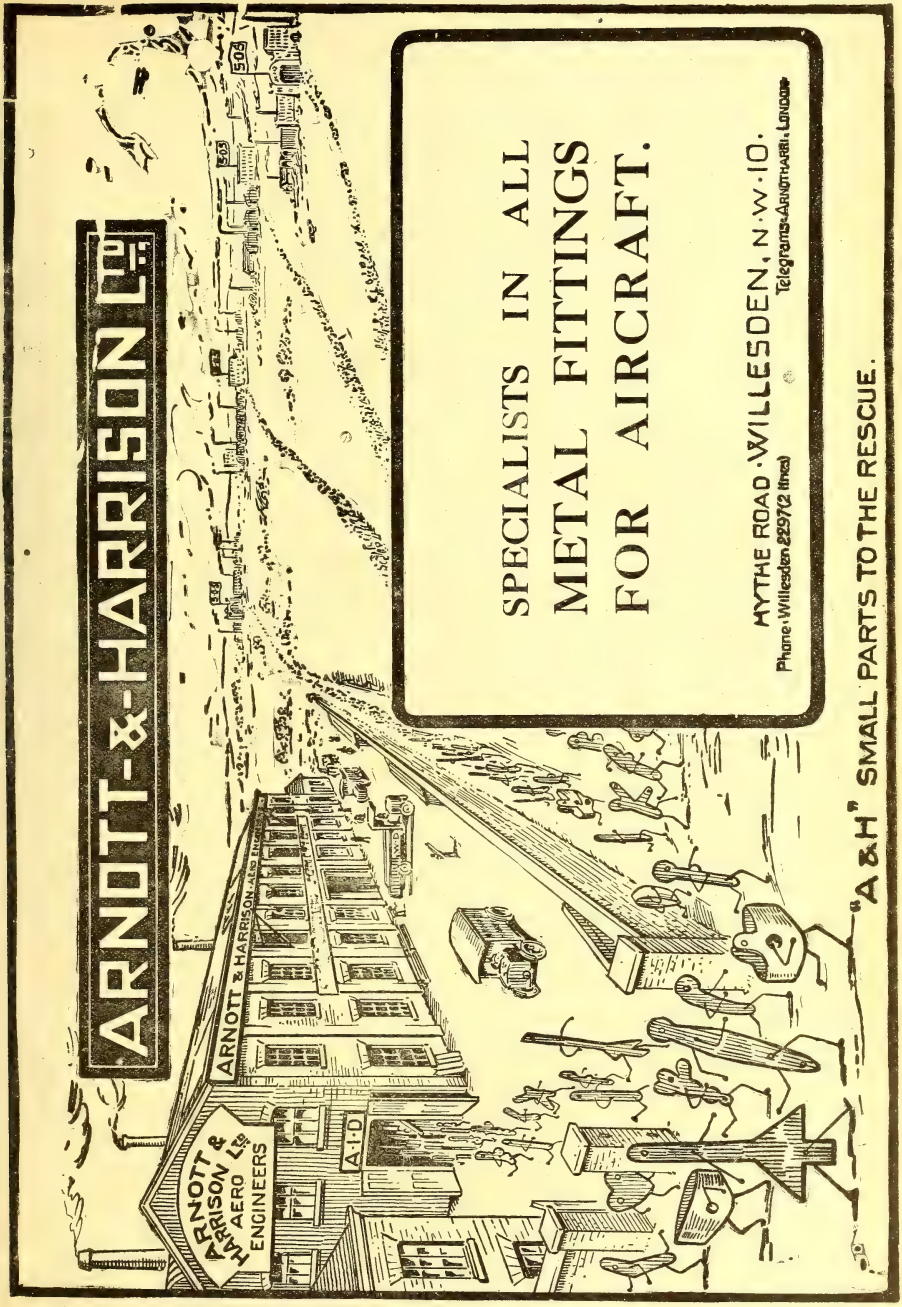
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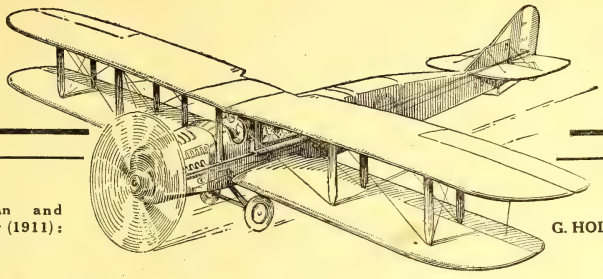
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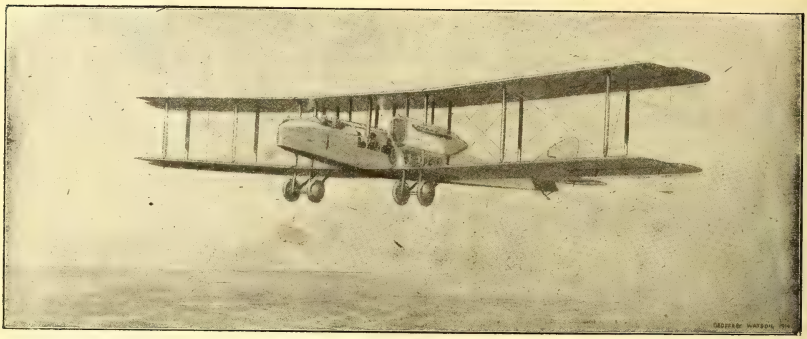
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THE WEEKLY COMMENTARY.

The descriptions of the machines of the Aircraft Manufacturing Company's De H. series, which begin in this issue, are a continuation of the articles on Modern British Aircraft. A number of the earlier types can perhaps not be described strictly as modern aircraft. Nevertheless, the work of Captain De Havilland has had so important an influence on the trend of modern design that the inclusion of the specifications of these machines is felt to be justified.

Some details of the work of the Steel Wing Company will be found in an article in this issue. This firm was certainly one of the first in the world successfully to attack the problems of steel wing construction, and the brief description of the methods employed and the difficulties successfully overcome will, it is believed, be found to be of great interest.

Steel construction for aircraft is bound to become of increasing importance, because the absence of any liability to warp and distort under varying climatic conditions, which is inevitable with a light wooden structure, is thereby avoided, and because with increasing size in the machine the difficulty of obtaining suitable wood increases very rapidly, whereas the difficulties of combining the necessary local strength without undue weight in a steel construction diminishes as the size of the structural members increases.

An article dealing with the construction of the large Tarrant triplane will be found on page 1959 of this issue. The methods of construction of the spars of this machine are novel, as applied to wood.

The adoption of such a form of construction has a direct bearing upon the question of steel construction alluded to above. The effect of a more economical distribution of the material employed in wood spars is really to increase the limits of size at which a wooden spar can be used economically, and to make the problem of metal spar design to compete with the wooden type even more difficult than it now is.

In this connection, whilst it must be admitted that the Tarrant construction is extremely ingenious, and ought to save a considerable amount of weight, full advantage of it does not appear to have been taken in the case of the machine described.

The weights which are given by the makers for the component units appear to be abnormally high, particularly those for the wings and the fuselage. Doubtless this is purposeful, the machine being purely experimental, and a considerable improvement in this respect may be expected with increasing practical experience.

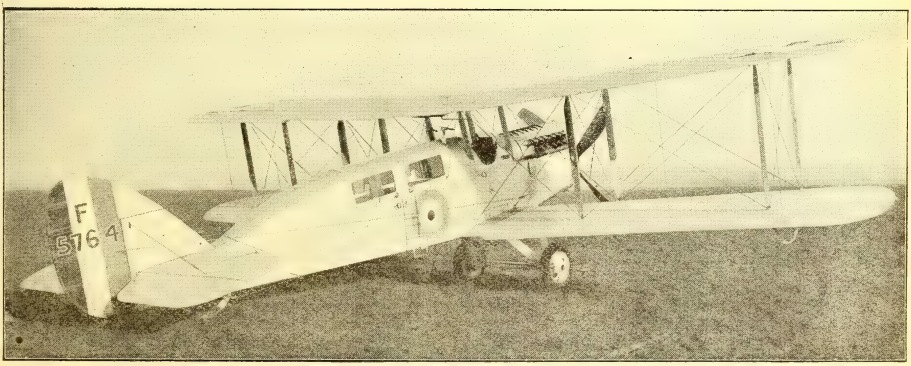
MODERN BRITISH AEROPLANES.

III.—The Aircraft Manufacturing Co., Ltd.

The Aircraft Manufacturing Co., Ltd., was founded in 1912 by Mr. Holt Thomas, who held the sole manufacturing rights in the United Kingdom for the designs of Henri and Maurice Farman.

During 1914 Mr. Holt Thomas secured the services of Capt. Geoffrey de Havilland, R.F.C., as the firm's designer-in-chief, and has produced the series of extraordinarily successful machines which have made Capt. de Havilland's initials famous.

As a matter of general interest, and for purposes of reference, specifications of the whole of the "De H." series are included in the following descriptions, but no illustrations are given of the older types of this make. With the exception of the De H.3 and the D.H.1a, of which there appears to be no illustrations extant, all these machines have been illustrated in the back numbers of THE AEROPLANE.



An "Airco" De H4 (375-h.p. "Eagle" Rolls-Royce) converted to Passenger Carrying purposes.

THE AIRCO DE H 1.

The first of the series, produced just before the declaration of war, was a two-seater Renault-engined "pusher" machine.

SPECIFICATION.

Type of machine	Biplane "Pusher."
Name or type No. of machine	De H.1.
Span	41 ft.
Gap, maximum and minimum	5 ft. 7 ins.
Overall length	28 ft. 11⅝ ins.
Maximum height	11 ft. 4 ins.
Chord	5 ft. 6 ins.
Total surface of wings, including centre plane and ailerons	409.3 sq. ft.
Span of tail	12 ft. 5½ ins.
Total area of tail (empennage)	80.45 sq. ft.
Area of elevators	11.0 sq. ft. each.
Area of rudder	16.15 sq. ft.
Area of fin	4.05 sq. ft.
Area of each aileron	18.0 sq. ft.
Engine type and h.p.	80 h.p. Renault.
Airscrew, diam., pitch and revs.	9.03 dia.; 9.2 pitch; 870 revs.
Weight of machine empty	1,356 lbs.
Weight of machine full load	2,044 lbs.
Load per sq. ft.	4.99 lbs.
Weight per h.p. full load	25.5 lbs.
Tank capacity in gallons	30 gallons.
PERFORMANCE—	
Speed low down	78 m.p.h.
Landing speed	41 m.p.h.
Climb—	
To 3,500 feet	11¼ mins.
Disposable load apart from fuel	420 lbs.
Total weight of machine loaded	2,044 lbs.

THE AIRCO DE H.1A.

This was a modified DeH.1 fitted with a 120 Beardmore engine in place of the original Renault.

SPECIFICATION.

Type of machine	Biplane "Pusher."
Name or type No. of machine	De H.1a.
Span	41 ft.
Gap, maximum and minimum	5 ft. 7 ins.
Overall length	28 ft. 11¼ ins.
Maximum height	11 ft. 2 ins.
Chord	5 ft. 6 ins.
Total surface of wings, including centre plane and ailerons	409.3 sq. ft.
Span of tail	12 ft. 3 ins.
Total area of tail (empennage)	79.9 sq. ft.
Area of elevators	11.0 sq. ft. each.
Area of rudder	15.6 sq. ft.
Area of fin	4.65 sq. ft.
Area of each aileron	18.0 sq. ft.
Engine type and h.p.	120 h.p. Beardmore.
Airscrew, diam., pitch and revs.	9.03 dia., 9.2 pitch, 1,350 revs.
Weight of machine empty	1,672 lbs.
Weight of machine full load	2,400 lbs.
Load per sq. ft.	5.87 lbs.
Weight per h.p. full load	18.45 lbs.
Tank capacity in gallons	33 gallons.
PERFORMANCE—	
Speed low down	89 m.p.h.
Landing speed	49 m.p.h.
Climb—	
To 3,500 feet	6.45 mins.
Disposable load apart from fuel	420 lbs.

THE AIRCO DE H.2.

The DeH.2 was produced in 1915 to meet the need for a high-speed single-seater fighter.

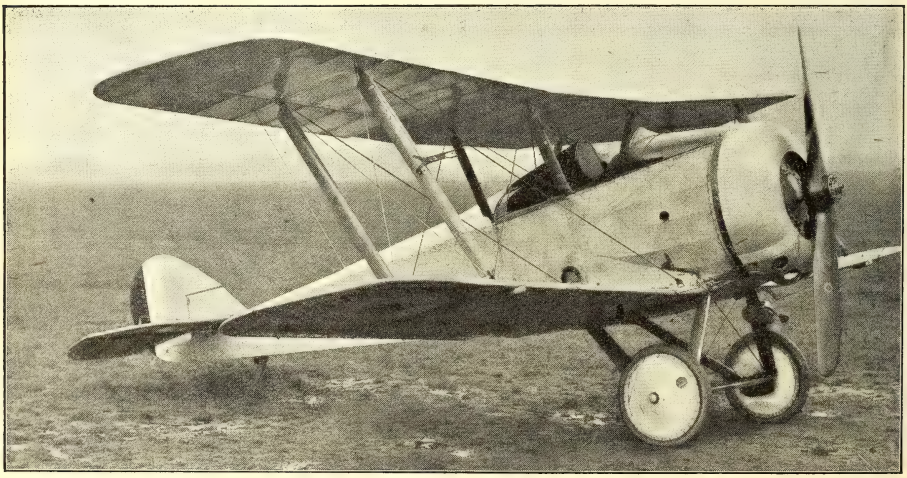
At that time the synchronised machine-gun firing through the airscrew had not been developed in this country, and consequently the high-speed tractor single-seater was of very little use for fighting purposes.

This machine was therefore an attempt to combine a high performance with the unobstructed use of a machine-gun firing straight ahead, which is possible with a machine of the "pusher" type.

In this respect the DeH.2 was extraordinarily successful. During 1915 and the early part of 1916 this type of machine gave an excellent account of itself on the Western Front, but was displaced by machines of the "tractor" type when the use of synchronised guns became general.

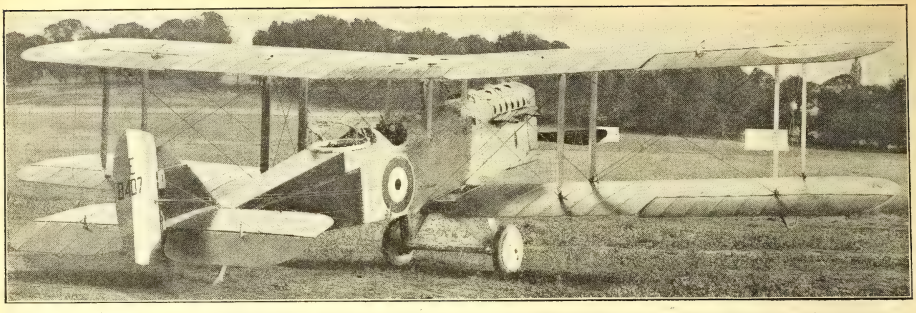
SPECIFICATION.

Type of machine	Biplane "Pusher."
Name or type No. of machine	De H.2.
Span	28 ft. 0½ ins.
Gap, maximum and minimum	4 ft. 6 ins.
Overall length	25 ft. 2⅜ ins.
Maximum height	9 ft. 6⅛ ins.
Chord	4 ft. 9 ins.
Total surface of wings, including centre plane and ailerons	228.0 sq. ft.
Span of tail	10 ft. 3 ins.
Total area of tail (empennage)	56.5 sq. ft.
Area of elevators	6.8 sq. ft. each.
Area of rudder	13.5 sq. ft.
Area of fin	2.4 sq. ft.
Area of each aileron	9.7 sq. ft.
Engine type and h.p.	100 h.p. Gnôme.
Airscrew, diam., pitch and revs.	8.0 dia., 7.7 pitch, 1,350 revs.
Weight of machine empty	896 lbs.
Weight of machine full load	1,320 lbs.
Load per sq. ft.	5.8 lbs.
Weight per h.p. full load	13.2 lbs.
Tank capacity in gallons	22.4 gallons.
PERFORMANCE—	
Speed low down	93 m.p.h.
Landing speed	45 m.p.h.



Three-quarter Front View of the Airco De H.5 (110 h.p. Le Rhône Engine).


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Capt. LANG, Pilot, R.A.F., and Lieut. BLOWES, Observer, broke the World's Record in ascending to the height of 30,500 feet on a D.H.9. Biplane fitted with a
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AERO ENGINES



Three-quarter View from Rear, "Airco" De H.9A (400-h.p. Liberty Engine).

Climb—	
To 6,500 feet	8.40 mins.
Disposable load apart from fuel	213 lbs.
Total weight of machine loaded	1,320 lbs.

THE AIRCO DE H.3.

This machine, produced in 1915, was never put into service. It is of interest, however, as one of the earliest attempts at building a twin-engined machine, and as the ancestor of the DeH.10.

SPECIFICATION.

Type of machine	Biplane "Pusher" (2 engines)
Name or type No. of machine	De H.3.
Span	60 ft. 10 ins.
Gap, maximum and minimum	7 ft.
Overall length	36 ft. 10 ins.
Maximum height	14 ft. 6 ins.
Chord	6 ft. 9 ins.
Total surface of wings, including centre plane and ailerons	790.0 sq. ft.
Span of tail	23 ft. 2 ins.
Total area of tail (empennage)	164.0 sq. ft.
Area of elevators	25.5 sq. ft. each.
Area of rudder	22.0 sq. ft.
Area of fin	13.0 sq. ft.
Area of each aileron	30.7 sq. ft.
Engine type and h.p.	**Two 120 h.p. Beardmore.**
Airscrew, diam., pitch and revs.	9.03 dia., 9.18 pitch, 1,400 rev
Weight of machine empty	3,982 lbs.
Weight of machine full load	5,776 lbs.
Load per sq. ft.	7.3 lbs.
Weight per h.p. full load	22.2 lbs.
Tank capacity in gallons	**140 gallons**
Performance—	
Speed low down	95 m.p.h
Climb—	
To 6,500 feet	24 mins.
Landing speed	53 m.p.h.
Disposable load apart from fuel	711 lbs.
Total weight of machine loaded	5,776 lbs.

THE AIRCO DE H.4.

The DeH.4 was the first really high-speed British general utility machine of the medium weight type fitted with a high-power stationary engine. In the original form produced in 1916—fitted with a B.H.P. engine of 240 h.p.—the DeH.4 had a speed greater than, and a climb and ceiling little if at all inferior to, that of the best of the rotary-engined single-seater fighters of that date.

It was thus possible to use these machines for reconnaissance and photographic work over the lines without the need for a fighter escort, since their excellent performance, and the fact that they were fitted with a gun ring in the after seat in addition to a synchronised gun firing through the airscrew, put them upon at least equal terms with any existing type of enemy fighter.

The later editions of the same type fitted with "Eagle" Rolls-Royce engines, were considerably more valuable, and were extensively used for day bombing, in addition to reconnaisance work.

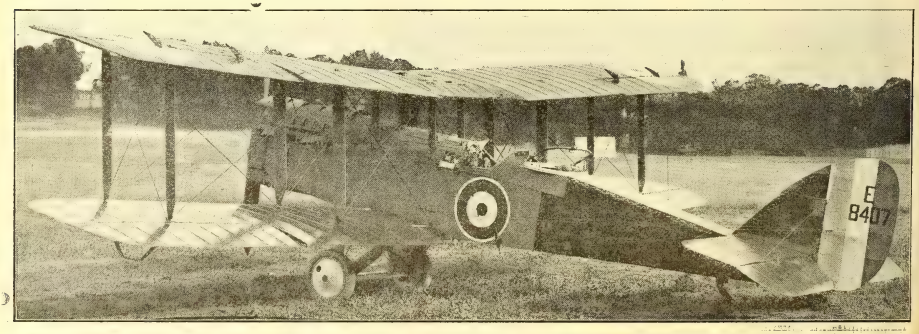
From a structural point of view this machine is chiefly remarkable for the very extensive use which is made of three-ply wood in the fuselage.

From the nose to aft of the passenger's seat the fuselage is devoid of wire bracing, a three-ply covering serving the purpose. Not only is this the case, but the whole of the engine mountings are built of ply-wood, which takes the place of the metal plates commonly used for such purposes.

It is thus possible to put bullet holes through almost any part of the front end of the fuselage without seriously impairing the strength of the structure—whereas with the usual methods of construction a single lucky shot may destroy an important bracing, or cut out the flange of an engine plate, and seriously weaken the structure.

SPECIFICATION.

Type of machine	Biplane "Tractor."
Name or type No. of machine	De H.4.
Span	42 ft. 4⅝ ins
Gap, maximum and minimum	5 ft. 6 ins.
Overall length	30 ft.
Maximum height	11 ft. 4½ ins.
Chord	5 ft. 6 ins.
Total surface of wings, including centre plane and ailerons	434.0 sq. ft.
Span of tail	14 ft.
Total area of tail (empennage)	81.1 sq. ft.
Area of elevators	12.0 sq. ft. each.
Area of rudder	13.7 sq. ft.
Area of fin	5.4 sq. ft.
Area of each aileron	20.5 sq. ft.
Engine type and h.p.	240 h.p. B.H.P.



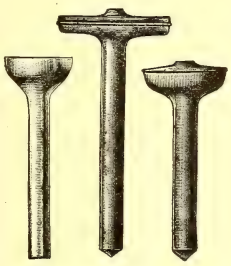
Another View of the "Airco" De H.9A (400-h.p. Liberty Engine).

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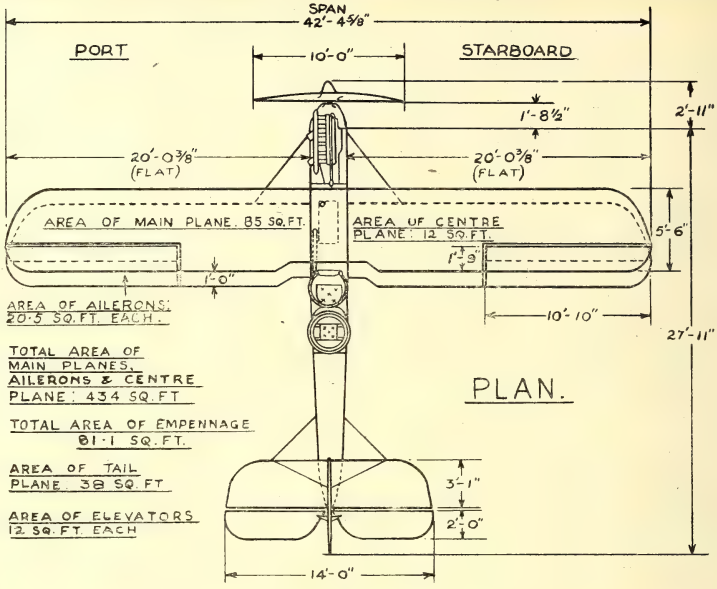
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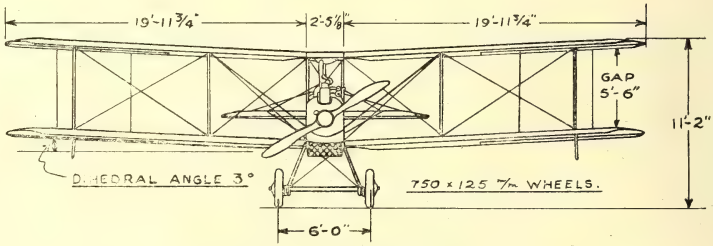


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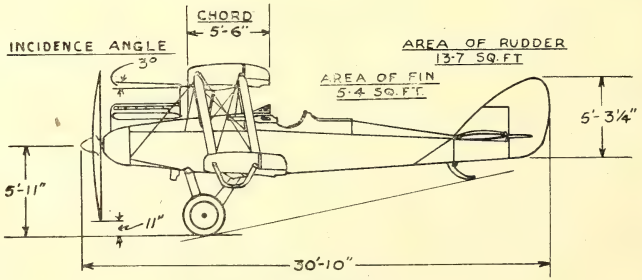
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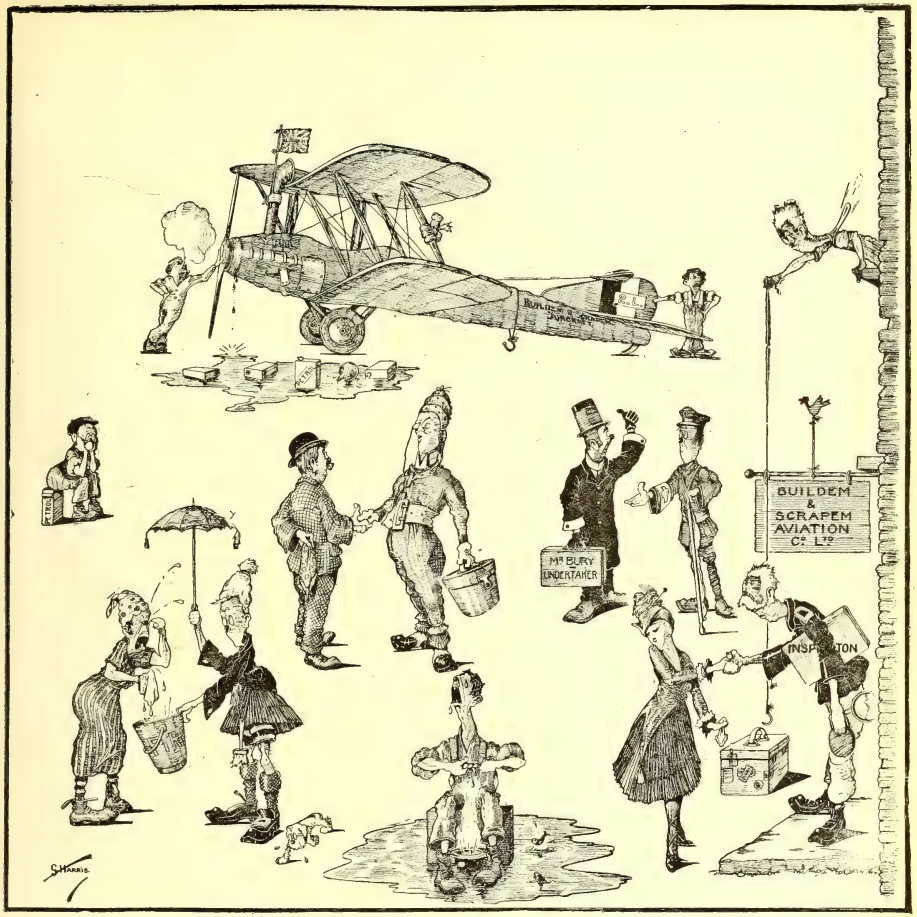


SIDE ELEVATION

DE H.9.

FORD-JONES/19

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Weight of machine full load ...	3,400 lbs.
Load per sq. ft.	7.84 lbs.
Weight per h.p. full load	14.35 lbs.
Tank capacity in gallons.....	66 gallons.
PERFORMANCE—	
Speed low down	120 m.p.h.
Landing speed	52 m.p.h.
Climb—	
To 6,500 feet	8 mins.
To 10,000 feet	14.10 mins.
To 15,000 feet	29.15 mins.
WITH ROLLS-ROYCE "EAGLE" ENGINE (375 h.p.)	
PERFORMANCE—	
Speed low down-	136¾ m.p.h.
Climb—	
To 6,500 feet	5.15 mins.
To 10,000 feet	9 mins.
To 15,000 feet	16.30 mins.
Disposable load apart from fuel	578 lbs.
Total weight of machine loaded	3,400 lbs.

THE AIRCO DE H.5.

This machine, produced late in 1916, and extensively used at the front in 1917, was in the main an effort to produce a single-seater fighter in which the pilot's view upwards and forward was not entirely blanketed by the top wing.

For this reason the top wing was staggered backwards very considerably, and the pilot's cockpit was put beneath the leading edge of that wing. In spite of the loss of efficiency which results from this backward stagger, Capt. De Havilland, by careful attention to the reduction of head resistance and weight, succeeded in producing a machine with a very good all-round performance.

SPECIFICATION.

Type of machine	Biplane "Tractor."
Name or type No. of machine ...	De H.5.
Span	25 ft. 8 ins.
Gap, maximum and minimum ...	4 ft. 9 ins.
Overall length	22 ft.
Maximum height	9 ft. 1⅝ ins.
Chord	4 ft. 6 ins.
Total surface of wings, including centre plane and ailerons	212.1 sq. ft.
Span of tail	8 ft. 4½ ins.
Total area of tail (empennage)...	34.1 sq. ft.
Area of elevators	6.1 sq. ft. each.
Area of rudder	6.3 sq. ft.
Area of fin	2.2 sq. ft.
Area of each aileron	11.6 sq. ft.
Engine type and h.p.	110 h.p. Le Rhône.
Airscrew, diam., pitch and revs.	8.5 dia., 8.33 pitch, 1,295 revs.
Weight of machine empty	1,012 lbs.
Weight of machine full load ...	1,492 lbs.
Load per sq. ft.	7.03 lbs.
Weight per h.p. full load	13.57 lbs.
Tank capacity in gallons.....	25 gallons.
PERFORMANCE—	
Speed at 10,000 feet	102 m.p.h.
Speed at 15,000 feet	89 m.p.h.
Landing speed	50 m.p.h.
Disposable load apart from fuel	260 lbs
Total weight of machine loaded	1,492 lbs.

THE AIRCO DE H.6.

The DeH.6 was produced as an elementary training machine for pilots, and to meet requirements fundamentally different from those which are desirable in machines for war use.

High performance was not desired, was in fact rather to be avoided. Cheapness and simplicity and strength of construction, together with ease in repair, and a low landing speed, were of primary importance.

As a result of these considerations, the DeH.6, vulgarly known alternatively as the "Clutching Hand" or the "Sky Hook," has very few of those rather expensive refinements of form which characterise most modern machines.

It has, in fact, rather the appearance of having been built by the mile, and cut off to order, which is, of course, a testimony to the thoroughness with which the desired simplicity has been reached in the design.

SPECIFICATION.

Type of machine	Biplane "Tractor."
Name or type No. of machine ...	De H.6.
Span	35 ft. 11 ins.
Gap, maximum and minimum ...	5 ft. 8½ ins.
Overall length	27 ft. 3½ ins.
Maximum height	10 ft. 9½ ins.
Chord	6 ft. 4 ins.
Total surface of wings, including centre plane and ailerons	436.3 sq. ft.
Span of tail	12 ft.
Total area of tail (empennage)...	81.0 sq. ft.
Area of elevators	13.0 sq. ft. each.
Area of rudder	12.0 sq. ft.
Area of fin	5.5 sq. ft.
Area of each aileron	19.0 sq. ft.
Engine type and h.p.	100 h.p. R.A.F. 1A.
Airscrew, diam., pitch and revs.	9.085 dia., 10.0 pitch, 1,800. revs.
Weight of machine empty	1,460 lbs.
Weight of machine full load ...	2,027 lbs.
Load per sq. ft.	4.64 lbs.
Weight per h.p. full load	20.27 lbs.
Tank capacity in gallons	28 gallons.
PERFORMANCE—	
Speed low down	66 m.p.h.
Landing speed	39 m.p.h.
Climb—	
To 6,500 feet	29 mins.
Disposable load apart from fuel	360 lbs.
Total weight of machine loaded	2,027 lbs.

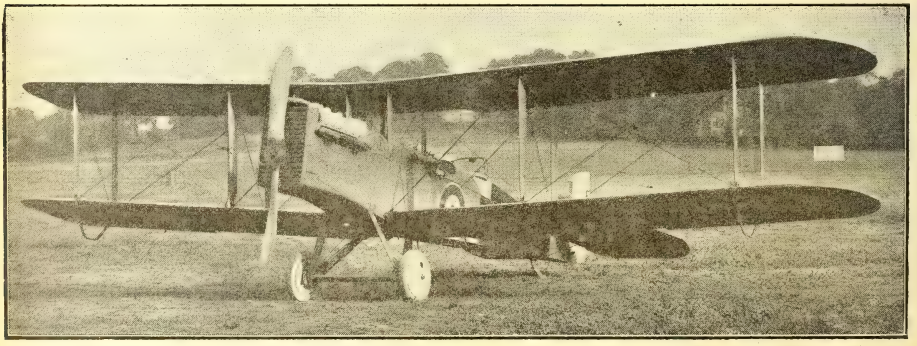
THE AIRCO DE H.9.

This machine is a modification of the DeH.4 intended for bombing work. The main alterations are that the pilot's cockpit has been moved from beneath the centre section to just behind the trailing edge thereof, leaving space for bombs in the fuselage, that the engine centre line has been slightly raised, and the chassis somewhat shortened, and that the nose radiator has been replaced by a vertical water tank and a radiator in the bottom of the fuselage.

The total weight empty has been reduced by about 100 lbs., the tank capacity is somewhat increased, and the total load carried has been increased by about 500 lbs., at the cost of a slight loss in speed and climb, and an increase in the landing speed.

SPECIFICATION.

Type of machine	Biplane "Tractor."
Name or type No. of machine ...	De H.9.
Span	42 ft. 4⅝ ins.
Gap, maximum and minimum ...	5 ft. 6 ins.
Overall length	30 ft. 10 ins.



Three-quarter Front View, the De H.9A. (Liberty Engine).

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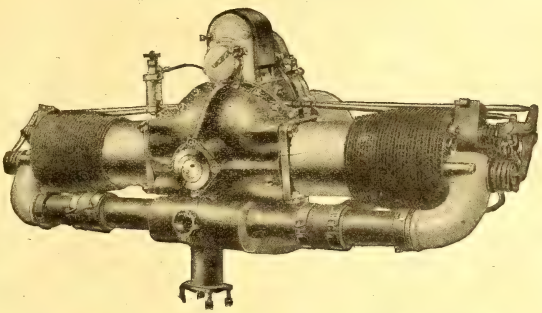
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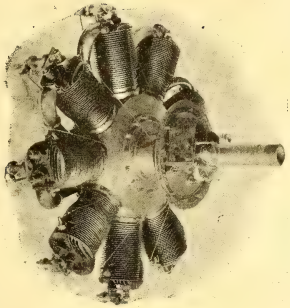


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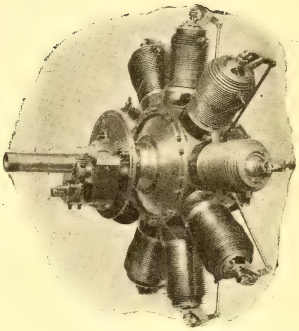
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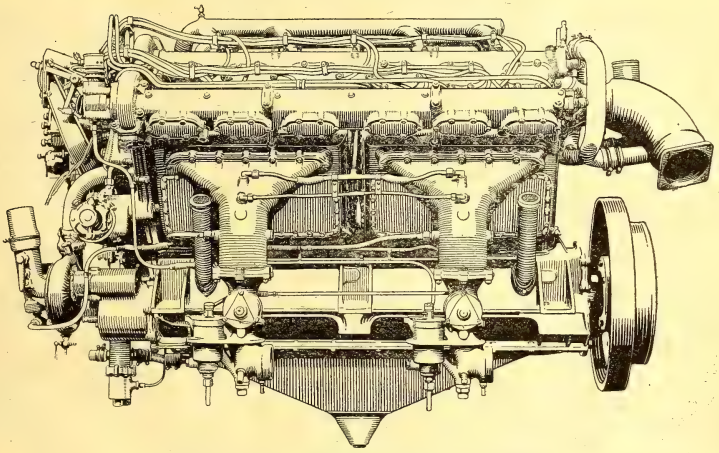


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"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London." Willesden 2455

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 103.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954 "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 1988 (8 lines).

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin." Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet." Byfleet 1, 2 & 3.

Thames Aviation Works, 141, Curtain Rd., E.C.2. London Wall 9766.

Vickers, Ltd, Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyta, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft, Yeovil "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Airships—

Airships, Ltd., High Street, Merton. Wimbledon 1314.

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 378

C. G. Spencer and Sons, Ltd. (See under "Balloons").

Air Transport—

British Aerial Transport Co., Ltd. Head Office: 38, Conduit Street, London, W.1. "Batigram Reg. London." Mayfair 637, 638.
Works: Hythe Road, Willesden, London, N.W.10. "Aerbrirans, Phone, London." Willesden, 2272, 2273.

Aluminium Castings (Sand and Die)

Coan, R. W., 219, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 3846.

Balloons—

C. G. Spencer and Sons, Ltd., 50A, Highbury Grove, N.5. "Aeronaut, London." Dalston 1893.

Bent Timber Parts—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London" Museum 496.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Bearings (Etonia Cast Phosphor Bronze)

Brown Bros., Ltd, Gt. Eastern St., E.C.1.
Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927.

Blinds—

J. Avery & Co., 81, Gt. Portland Street, London, W. "Velarium, London." Gerrard 6620.

Blowpipes (Oxy-Acetylene)—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic. 3540 (3 lines).

Bolts—

Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16 Dalston 2500 (2 lines).

Books (Aero Engines)—

Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2

Buildings—

Boulton & Paul, Ltd., Rose Lane, Norwich "Aviation, Norwich." Norwich 851

Rubery Owen & Co., Darlaston, South Staffs

Cable Coverings and Cable Controls—

The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green." Acock's Green 103 & 104.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4670.

Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricodon, Fen, London." Avenue 34 and 35.

Clothing—

Burberry's, Ltd, Haymarket, S.W.1

Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, 'Phone, London." Hampstead 4403 & 4404.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Aeros, Richmond" Richmond 1681.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England "Thompson Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 4046.

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London" Gerrard 280.

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 440.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries" Dumfries 281-282.

Beardmore Aero Eng., Ltd, 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd (Salmson), 87, Victoria Street, London, S.W.1. "Aerofight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1010.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London" Gerrard 8926.

Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1. "Rolhead, London." Gerrard 1654-5-6.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 985.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames" Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1984.

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston road, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 981.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London." Willesden 2480.

Electric Cables—

E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 24x.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston road." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

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Fluxes—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).
The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Furniture (Office)—
Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6179.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

Glue—
Cannon, B., & Co., Ltd, Lincoln. London Office, 110, Cannon Street, E.C.4. "Bececolin, Cannon, London." City 1206.
Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid.) "Excroiden, 'Phone, London." Avenue 4611-2.
Meudine Co., 8, Arthur Street, E.C. Bank 5873.

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Hack Saw Blades and Machines—
Victor Saw Works, Ltd., 2 and 3, West Street, Finsbury Circus, London, E.C. "Vicsaw, Phone, London." London Wall 1880.

Heating and Ventilating—
Chas. P. Kinnell and Co., Ltd., 65 & 65A, Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 763.

Instruments—
British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

Insurance—
Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 6944.
Bray, Gibb & Co., Ltd., 166, Piccadilly, W.1.
S. Sackville & Sons, Duchy Chambers, 4, Clarence Street, Manchester.

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London "Pegamoid, Cent., London." City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—
W. B. Dick & Co, Ltd, 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 2854 (2 lines.)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 430.
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asteroidal, Coventry." Coventry 278.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 999 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—
Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1 "Installing, Rusroad, London." Museum 70.
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selacro, Phone, London." Regent 1181.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros, Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1 "Imbrowned, Bethroad, London." London Wall 6300.
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham." Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115.

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Rusroad, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—
Anglo-American Oil Co., Ltd., 36, Queen Anne's Gate, London, S.W.
C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London" Central 11305 & 13466.

Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.
C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—
British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich, "Aviation, Norwich." Norwich 851.
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames "Ebora, Kingston." Kingston 672.
Integral Propeller Co., Ltd., "Aviprop, Hyde, London." Hendon 9. Kingsbury 104
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 26.

Rawhide Hammers—
Ira Stephens, Whitelands Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1 "Masticator, Isling, London." City 3811 & 3812.

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830
British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selacro, Phone, London." Regent 1181.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).



The · Aeroplane ·

Accumulators—

The Chloride Electrical Storage Co., Ltd., Clifton Junction, near Manchester. "Chloride, Pendlebury" Central, Manchester, 7638. Pendlebury, 11.

Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." 3540 Victoria (3 lines).

Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London" Kingsbury 220.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle - on - Tyne. "Armstrong Aviation, Newcastle-on-Tyne" Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

British Aerial Transport Co., Ltd. Head Office: 38, Conduit Street, London, W.1. "Batigram Reg. London." Mayfair 637, 638.
Works: Hythe Road, Willesden, London, N.W.10. "Aerbrirans, Phone, London." Willesden, 2272, 2273.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3066.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hampstead 5551.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 2403 and 4424.

Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2603 (2 lines).

Eastbourne Aviation Co., Ltd., Eastbourne "Aircraft, Eastbourne." Eastbourne 1176.

Glendower Aircraft Co., Ltd., 54, Sussex Place, South Kensington, S.W.7. "Glenacelle, Southkens, London." Kensington 7605 (3 lines).

Gosport Aircraft Co., Gosport "Flight Gosport." Gosport 217.

Grahame-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.
London Office, 12, Regent Street, S.W.1. Regent 2084.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophil, Crickle, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St James, London." Regent 912.

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet, "Martinsyde, Weybridge." Woking 331; Byfleet 171.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London" Willesden 2455

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester" City 8510-8511, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954 "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston" Kingston 1088 (8 lines).

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin." Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet." Byfleet 1, 2 & 3.

Thames Aviation Works, 141, Curtain Rd., E.C.2. London Wall 9766.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyta, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft, Yeovil "Aircraft, Yeovil" Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3

Airships—

Airships, Ltd., High Street, Merton. Wimbledon 1314.

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 378.

C. G. Spencer and Sons, Ltd. (See under "Balloons").

Air Transport—

British Aerial Transport Co., Ltd. Head Office: 38, Conduit Street, London, W.1. "Batigram Reg. London." Mayfair 637, 638.
Works: Hythe Road, Willesden, London, N.W.10. "Aerbrirans, Phone, London." Willesden, 2272, 2273.

Aluminium Castings (Sand and Die)

Coan, R. W., 210, Goswell Road, London, E.C.1. "Krankases, Isling, London" City 3846.

Balloons—

C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronaut, London." Dalston 1893.

Bent Timber Parts—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London" Museum 466.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Bearings (Etonia Cast Phosphor Bronze)

Brown Bros., Ltd., 61, Eastern St., E.C.1
Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927

Blinds—

J. Avery & Co., 81, 61 Portland Street, London, W. "Velarium, London" Gerrard 6620.

Blowpipes (Oxy-Acetylene)—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic. 4830

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic. 3540 (3 lines).

Bolts—

Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16 Dalston 2500 (2 lines).

Books (Aero Engines)—

Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2

Buildings—

Boulton & Paul, Ltd., Rose Lane, Norwich "Aviation, Norwich." Norwich 851

Rubery Owen & Co., Darlaston, South Staffs.

Cable Coverings and Cable Controls—

The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green." Acock's Green 103 & 104

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2406 (3 lines).

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4670

Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricodon, Fen, London." Avenue 34 and 35

Clothing—

Burberry's, Ltd., Haymarket, S.W.1 Regent 2165.

Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., 61 Eastern St., E.C.1.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, 'Phone, London." Hampstead 2403 & 4404.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Acros, Richmond" Richmond 1681.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England "Thompson Bros, Bilston." Bilston 10

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1 "Tetrafrex, Piccy, London." Gerrard 2312

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London" Recent 4038

The British Emaillite Co., Ltd., 20, Regent Street, S.W.1. "Riddleyton, Piccy, London" Gerrard 229

Cellon, Ltd., 22, Cork Street, London, W.1 "Ajawly, Reg, London." Gerrard 440

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Olcoting, Stra, London" East 955.

Engines and Parts—

Alley, W. H., & Co., Ltd., Bedford "Pump, Bedford." Bedford No. 1

Arrol-Johnston, Ltd., Dumfries "Mocar, Dumfries" Dumfries 251-252

Beardmore Aero Eng., Ltd., 122, Great Portland Street, W.1. "Beardmore, London." Gerrard 298

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd. (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London." Vic 7026

Gordon Watney & Co., Ltd., Weybridge "Mercédès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith" Hammersmith 1010.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London" Gerrard 8026

Rolls-Royce, Ltd., 13 and 15, Conduit Street, W.1. "Rolhead, London" Gerrard 1034-36.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954 "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton" Wolverhampton 685.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames" Walton-on-Thames 220

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1674.

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London" Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 357, Cleveland Street, London, W.1. "Installing, Euroad, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 300, Bradford Street, Birmingham "Fahrenheit, Birmingham" Midland 921.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London." Willesden 2480.

Electric Cables—

E. Kalker and Co., Coventry. "Kalker, Covcntry." Coventry 248.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 147, Cleveland Street, London, W.1. "Installing, Euroad." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London" Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61.



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Fluxes—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (4 lines).

The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—

Gosport Aircraft Co., Gosport. "Flight, Gosport" Gosport 217

Furniture (Office)—

Cooke's (Fensbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6179

Galvanising—

Bodlon & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—

J. A. Preshwich & Co., Northumberland Park, Tottenham, N.17

Youngner, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0160

Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mossgear, Birmingham" East 407.

Glue—

Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Beecolin, Cannon, London." City 1206

Improved Liquid Glues Co., Ltd., 61 Hermitage Street, E. (Croid.) "Exeroiden, 'Phone, London." Avenue 3611-2

Mendine Co., 5, Arthur Street, E.C. Bank 5873.

Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London" Regent 1340.

Hack Saw Blades and Machines—

Victor Saw Works, Ltd., 2 and 3, West Street, Finsbury Circus, London, E.C. "Victaw, Phone, London." London Wall 1880.

Heating and Ventilating—

Chas. F. Finnell and Co., Ltd., 65 & 66a, Southwark Street, London, S.E.1. "Finnell, London" Hop 372 (2 lines).

The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London" Hop 703.

Instruments—

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, Walthamstow 180.

Insurance—

Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 6934.

Bray, Gibb & Co., Ltd., 166, Piccadilly, W.1.

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Leather Cloth—

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Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—

The British Lighting & Ignition Co., Ltd., 284, Tottenham Court Road, W.1. "Vicksmag, Phone, London" Museum 430.

The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Assocideal, Coventry" Coventry 278.

Metal Casement Manufacturers—

Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham" Central 499 (2 lines).

Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—

Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon, London" City 6342

Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury" Oldbury 111 (4 lines)

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction, Willesden 2207.

Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines)

British Metal (Kingston), Ltd., Kingston-on-Thames

Brown Bros., Ltd., 61 Eastern St., E.C.1.

Mann, Egerton & Co., Ltd., 147, Cleveland Street, London, W.1. "Installing, Euroad, London." Museum 70.

Rubery Owen & Co., Darlaston, South Staffs.

Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.

The Potax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—

Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 3033-3634-4035.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6390.

Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham" Central 793.

MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115

Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Eusroad, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—

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Anglo-American Oil Co., Ltd., 36, Queen Anne's Gate, London, S.W.

C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London" Central 11305 & 13466.

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C. G. Spencer & Sons, Ltd (See under "Balloons").

Piston Rings—

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The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield" Sheffield 2149

Presswork—

Rubery Owen & Co., Darlaston, South Staffs.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61

Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (4 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd., "Avitrop, Hyde, London."
Hendon 9. Kingsbury 104

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 526-521.

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.

Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—

The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 20

Rawhide Hammers—

Ira Stephens, Whitelands Leather Works, Ashton under-Lyne. "Stephens, 709, Ashton." Ashton 709.

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Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 206, Goswell Road, London, E.C.1. "Masticator, Isling, London" City 3811 & 3812.

Safety Belts—

C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

Screwing Die Heads—

Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0160

Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

Short Bros., Rochester "Seaplanes, Rochester." Chatham 627

Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights

Brown Bros., Ltd., Great Eastern St., E.C.1.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480

Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)

British Metal (Kingston), Ltd., Kingston-on-Thames.

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Sheet Metal Work—

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Sparking Plugs—

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Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Robinhood Engineering Works, Ltd., Newlands, Putney Vale, S.W.15. Makers of KLG Plugs. "Kaelgee, Phone, London." Putney 2132-3.

Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

Steel—

Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield." Central 4522-3-4.

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Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Tapes and Smallwares—

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.
C. E. Matthews & Co., Ltd., Castle Works, Bermondsey Square, S.E.1. "Webbance, Berm, London." Hop 4058.

Timber—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London. Museum 496. Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Time Recorders—

Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—

Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349.

Turnbuckles—

Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery Owen & Co., Darlaston, South Staffs.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston road." Museum 70 (4 lines).

Tyres—

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Central 3880 (5 lines).
The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

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The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjap, Phone, London." Mayfair 6347 (3 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 48." Wimbledon 45 and 1395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Welding and Cutting Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London" Vic 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Welding Repairs—

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Wind Shields—

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The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
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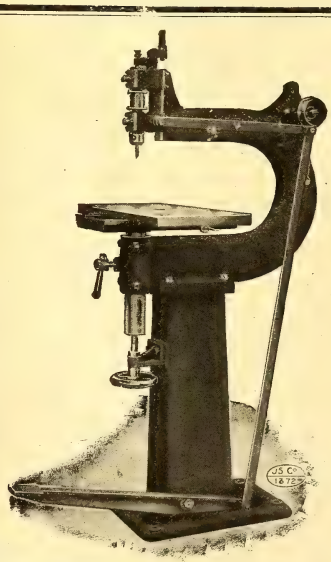
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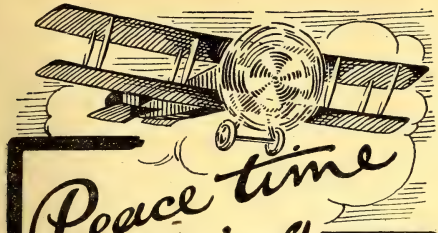
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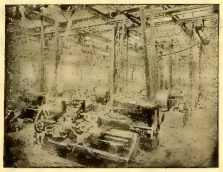
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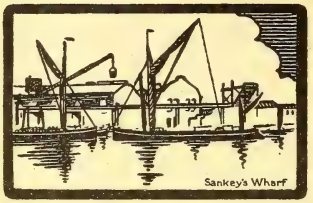
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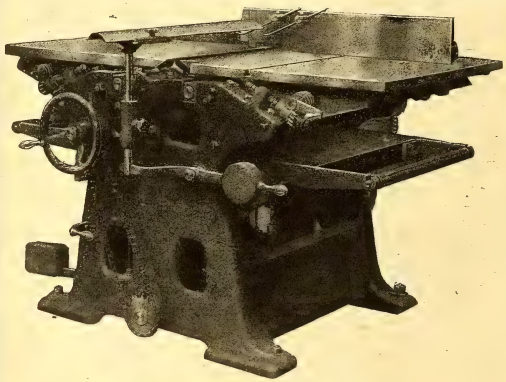
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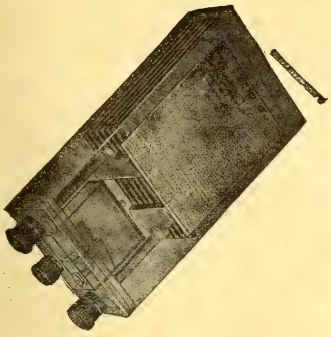
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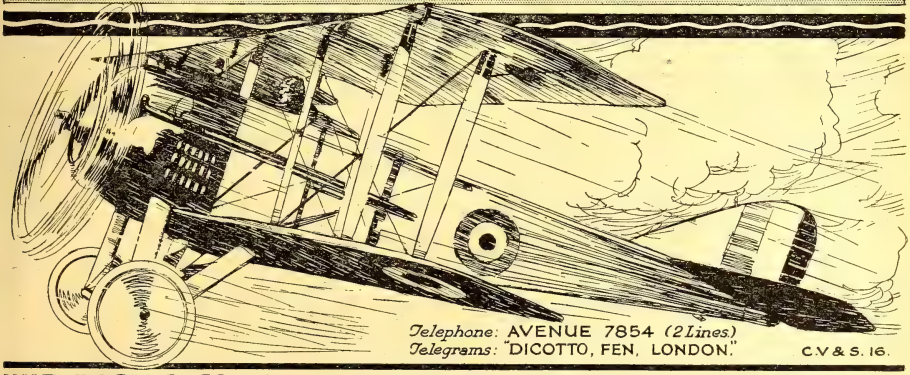
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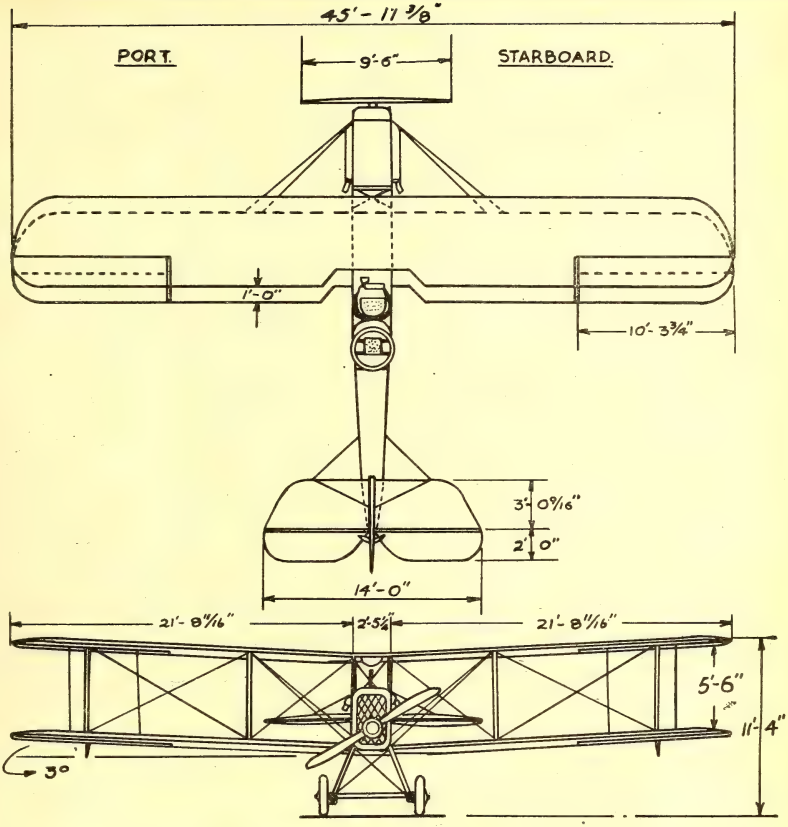
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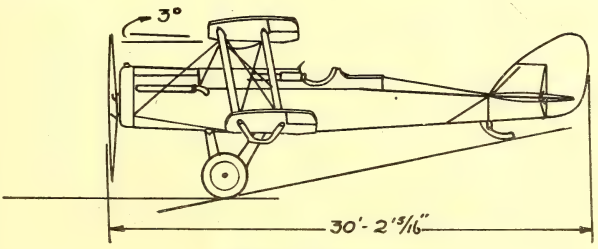
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FRONT ELEVATION.



SIDE ELEVATION

SCALE OF FEET.
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DeH 9A.

(400 H.P. LIBERTY 'TWELVE')

Ford-Jones, 19.

Maximum height	11 ft. 2 ins.
Chord	5 ft. 6 ins.
Total surface of wings, including centre plane and ailerons	434.0 sq. ft.
Span of tail	14 ft.
Total area of tail (empennage)...	81.1 sq. ft.
Area of elevators	12.0 sq. ft. each.
Area of rudder	13.7 sq. ft.
Area of fin	5.4 sq. ft.
Area of each aileron	20.5 sq. ft.
Engine type and h.p.	240 h.p. B.H.P.
Airscrew, diam., pitch and revs.	9.5 dia., 6.9 pitch, 1,525 revs.
Weight of machine empty	2,200 lbs
Weight of machine full load	3,890 lbs.
Load per sq. ft.	8.95 lbs.
Weight per h.p. full load	16.2 lbs.
Tank capacity in gallons	74 gallons.
Performance—	
Speed at 10,000 feet	110½ m.p.h.
Speed at 15,000 feet	102 m.p.h.
Landing speed	57 m.p.h.
Disposable load apart from fuel	1,121 lbs.
Total weight of machine loaded	3,890 lbs.

THE AIRCO DE H.9A.

This machine is an enlarged DeH.9, designed for the 375 h.p. Rolls, or the 400 h.p. Liberty. The span and the total surface have been somewhat increased, and the nose radiator has returned. Otherwise there is little alteration.

SPECIFICATION.

Type of machine	Biplane "Tractor."
Name or type No. of machine	De H.9a.
Span	45 ft. 11⅜ ins.
Gap, maximum and minimum	5 ft. 6 ins.
Overall length	30 ft. 3 ins.
Maximum height	11 ft. 4 ins.
Chord	5 ft. 9 ins.
Total surface of wings, including centre plane and ailerons	486.73 sq. ft.
Span of tail	14 ft.
Total area of tail (empennage)...	80.1 sq. ft.
Area of elevators	12.0 sq. ft. each.
Area of rudder	13.7 sq. ft.
Area of fin	5.4 sq. ft.
Area of each aileron	18.59 sq. ft.
Engine type and h.p.	375 h.p. Rolls-Royce or 400 Liberty.
Airscrew, diam., pitch and revs.	10.0 diam., 12.3 pitch, 1,780. revs.
Weight of machine empty	2,656 lbs.
Weight of machine full load	4,815 lbs.
Load per sq. ft.	9.89 lbs.
Weight per h.p. full load	12.8 lbs., 12.03 lbs.
Tank capacity in gallons	112 gallons.
Performance—Rolls-Royce 375 h.p. Engine	
Speed at 10,000 feet	110½ m.p.h.
Landing speed	59 m.p.h.
Climb—	
To 6,500 feet	11 mins.
To 10,000 feet	20.6 mins.
Disposable load apart from fuel	1,199 lbs
Total weight of machine loaded	4,815 lbs.

Note.—If less weight is carried a speed of 125½ m.p.h. is attained at 10,000 feet, and 116 m.p.h. at 15,000 feet.

(To be continued.)

DEMOBILISED FACTORIES.

Apropos the shutting down of the National Aircraft Factory at Whaddon, near Croydon, the following letter has been received:—

"Only those who knew what a fine Aircraft Factory this was, as I did, and that only a very short time ago was it actually completed and equipped with the most modern machinery for turning out complete an enormous number of aeroplanes, can realise what a terrible waste of plant this is for the construction necessary for the immediate future of Civil Aerial Transport.

"As a regular reader of your paper, I ask your opinion of this. Is it yet another instance of colossal official blundering, and can this kind of thing be avoided? Could not one of the large budding Civil Aerial Transport companies with capital enough acquire this ex-National Aircraft Factory for turning out airships, if needs be, as well as the Civil Transport type of 'plane'?"

The writer of the foregoing letter evidently lets his keenness as an engineer overcome his foresight as a business man.

If these National Aircraft Factories were continued they would naturally be employed on building aeroplanes of official design, and it has been proved by bitter experience that in aircraft, as in everything else, official designs are lamentably inferior to contemporary commercial designs produced under the spur of competition. It would be particularly damaging to the future of aviation if National Factories were allowed to have anything to do with the construction of aircraft for Civil Aerial Transport.

It would, in fact, pay the country better to burn the factory and melt the machinery down as scrap than to continue it as a National Factory under official control. In the former case a mere matter of two million pounds would be lost to the country, and in the other more than that in millions per annum would be wasted by incompetent officials, and irremediable harm would be done to the whole future of British Aeronautics. The old Royal Aircraft Factory at Farnborough, for example, must have cost this country many millions of pounds.

As regards the suggestion that one of the big Civil Aerial Transport companies should acquire this ex-National Aircraft Factory. The suggestion has something to recommend it, but it is well to point out that the actual transport companies will probably not build their own machines. In all other species of transport operating companies are invariably distinct from the producers of the vehicles which they use, with, perhaps, the sole exception of railway companies, who build their own locomotives and coaches. Even this, however, is not an invariable rule, as is proved by the number of firms which manufacture railway trucks and engines. For example, Harland & Wolff's do not run steamship lines and the Cunard Company do not build steamships.

It seems probable, however, that the majority of the aircraft-producing firms already possess factories which are more than capable of filling all needs for the next four or five years, and in that case it seems likely that the National Aircraft Factories will be turned on in the near future to produce goods of greater immediate general utility than aircraft are likely to be for a while.

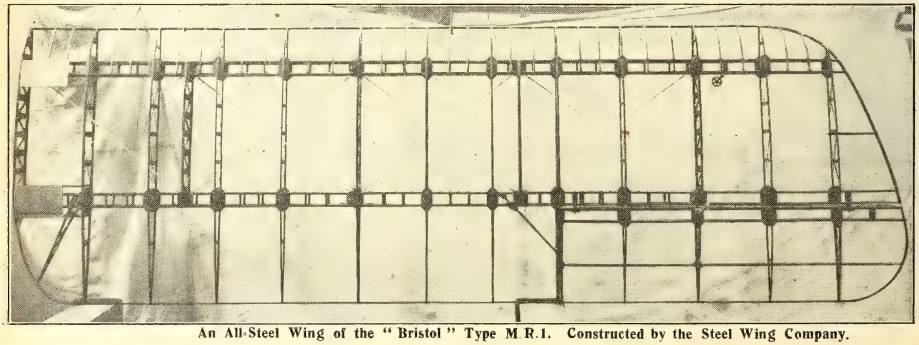
Meantime, the Whaddon factory is being put to excellent use as a Salvage Depot, and is definitely saving many thousands of pounds for the Nation. One hopes to describe its activities at an early date.

AN AMERICAN SUPERCHARGER.

According to an American journal, the B.F. Sturtevant Co. showed, amongst their exhibits at the American Aeronautical Exhibition, an arrangement for feeding the carburetter of an aero engine with air at constant pressure, so maintaining the engine power at high altitudes. The plant consists of an air pump driven from the crankshaft by a slipping belt.

The pump speed is controlled by some mechanism whose action is not described in understandable terms, but which tightens up the belt as the atmospheric pressure decreases.

This appears to be a simple—if somewhat crude—solution of this difficulty.



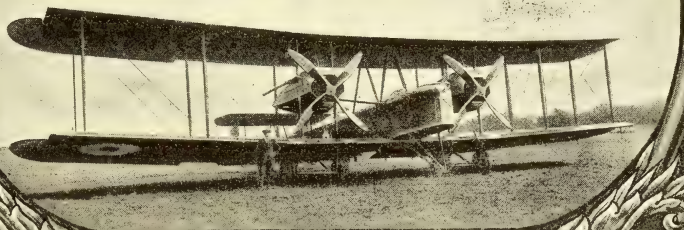
An All-Steel Wing of the "Bristol" Type M.R.I. Constructed by the Steel Wing Company.

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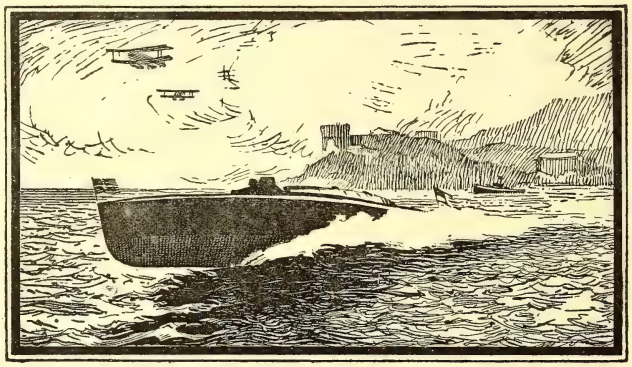
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STEEL WING CONSTRUCTION.

It is now many years since certain classes of alleged engineers acquired the custom of scoffing at the designers of aircraft for their habits of employing such a material as timber for structural work and held forth upon the merits of steel. Generally speaking, these early criticisms were founded on a complete ignorance of the qualities of timber, and a failure to realise the inherent difficulties of steel construction for so light a structure as that of the aeroplane.

These difficulties almost all arise from the fact that to produce members of the light weight necessary for aeroplane construction in steel it is necessary to use the material in the form of very thin sheet.

By using steel in this form it is comparatively simple to design spars no heavier than and equally as strong as wooden spars when only the primary stresses are taken into account, but when secondary stresses are considered it is difficult to secure the necessary stiffness locally to prevent buckling of webs and flanges

The desired result may be obtained by suitably corrugating the sheet material before building up the spars.

This involves laying down rolling plants and rolls for the purpose—since the owners of rolling plants have almost invariably refused to undertake the rolling of the type of section required, particularly in high tensile steels, and the cost of producing steel spars becomes excessive, unless really large quantities of any one type of spar are to be manufactured.

The acute shortage of good aeroplane timber during the latter years of the war led the Department of Aircraft Production to encourage the design and manufacture of metal wing spars, and, since there were excellent prospects of really large production orders for successful designs, the question of the preliminary cost of the experimental spars became unimportant.

Amongst those who have produced solutions of the problem, The Steel Wing Company, of 48a, Gillingham Street, S.W.1, appear to have achieved complete success.

This firm had attacked the problem of steel wing construction long before the awakening of the official mind to the importance of the matter, and as early as 1912 had produced experimental spars wherein the required local strength was obtained by the use of longitudinal corrugations in the flanges—actually in the form of flanges made of trough sections of thin steel riveted to webs of a light alloy, which was itself corrugated to provide the needed local stiffening.

This type of spar gave excellent results on test, but was rather heavier than was desirable.

The alloy webs were then replaced by steel strips, with deep vertical corrugations, which were riveted together in pairs, through the bottom of the vertical grooves formed in them, with pairs of sections forming top and bottom flanges

Various modifications of the pitch and depth of the corrugations in the web were tried, including the use of webs with diagonal corrugations riveted together with the corrugations sloping in opposite directions, with the object of reducing the amount of extra metal required to provide the local stiffening necessary, and to allow of a more effective rivet spacing.

At the moment a type of box spar with each flange made in one strip of steel with rolled longitudinal corrugations, riveted to two vertical strip webs has been adopted. The exact form of the webs is varied to suit the conditions.

Very largely the forms employed have been limited by the difficulties already referred to of rolling or drawing the sections desired, and to the surmounting of these difficulties the Steel Wing Company have devoted great care and attention.

Quite a number of firms have succeeded in producing, with more or less success, steel spars for wings, but the Steel Wing Co. have not been content with this, but have successfully produced wings with skeletons which are all steel.

Their earliest practical success was the manufacture of an all-steel wing for the B.E.2E, which gave very satisfactory results. They compared favourably with the standard wings.

This effort was followed by the equally successful manufacture of wings for other types of B.E., and when the Bristol Co. were producing the all-metal M.R.1, the Steel Wing Co were entrusted with the design of the wings for this machine. A photograph of this wing is given, from which it will be noticed that the spars are really twin very narrow I sections, tied together at the top and bottom.

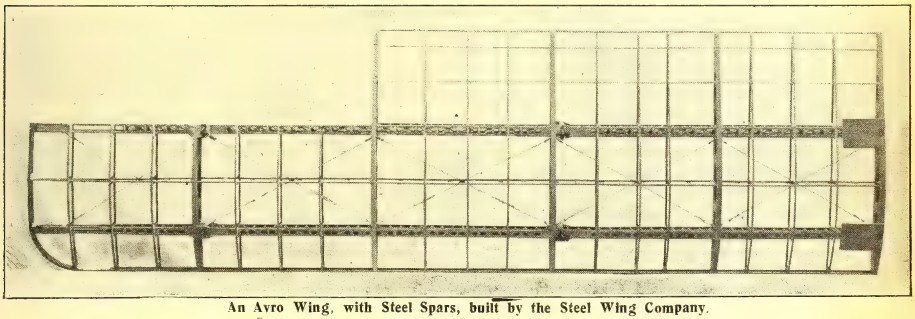
The machine originally selected by the Department of Aircraft Production as that for which steel spars were to be designed and tested was the Standard Avro Training machine.

Other considerations apart, this machine is of a distinctly light type, and the successful production of steel spars for such a machine is evidence of even greater possibilities for heavier classes of machines.

The first type of spar successfully built by the Steel Wing Co. for the Avro really consisted of twin I sections tied together across their top and bottom flanges.

Each I of the beam consisted of a steel strip with deep transverse (vertical) corrugations, with a thin channel riveted to the web at top and bottom.

To the top and bottom of the two I's thus formed there were riveted strips of steel stamped out in such wise as to leave a double diagonal bracing between the two vertical members.



An Avro Wing, with Steel Spars, built by the Steel Wing Company.

This type of spar has been used in a number of Avro wings, both in conjunction with the ordinary type of wooden rib, as shown in one of the photographs, and with steel ribs. Wings of the all-steel type are in daily use on experimental Avros and have given every satisfaction.

The assembly of this type of spar called for a considerable amount of labour, and to diminish this a new design, of which a sketch is attached, has been developed.

This newer type is a fairly simple box spar, of which the top and bottom flanges are of a rolled corrugated section, riveted to pressed webs. The assembly of this type of spar is very simple, and all the rivets are easily accessible for closing up.

The history of the development of the successful type of construction here referred to is extremely interesting, and in a further article on the subject it is hoped to trace this history step by step through all its stages.

FULL-SIZE TESTS.

It is reported that the American Bureau of Standards has decided to attack the problem of making accurate tests of full-size aeroplanes, and to that end has commenced work upon the development of instruments designed to record, simultaneously, engine speed and torque, airscrew thrust and machine air speed, angle of incidence, and inclination of flight path.

Efforts in this direction were long ago made by the Royal Aircraft Establishment—unfortunately without conspicuous success, and so far as can be determined such attempts have been abandoned.



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Before deciding to purchase or standardise on any particular make of aircraft it would be well to consult the B.A.T. Co., whose designing and allied productive capacity commands respect.

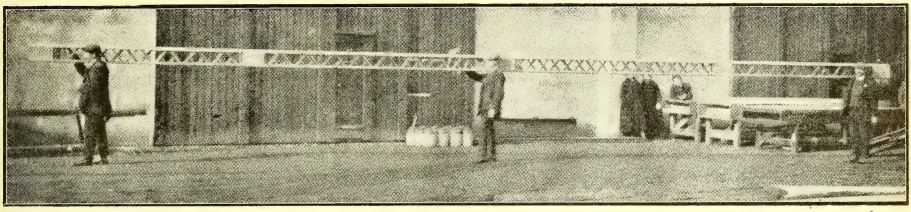
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THE TARRANT "TABOR" TRIPLANE.



A Complete Spar for one Section of a Wing of the Tarrant Triplane.

A general description of the Tarrant triplane was given in The Aeroplane of May 7th. The following account deals in more detail with the novel constructional methods employed.

The most interesting point in the whole machine is the novel wooden girder construction, which must be considered as an attempt on the part of the adherents of wood construction to meet the growing tendency towards the use of metal construction, by adopting a distribution of material very similar to that commonly employed in metal structures.

Wing Structure.

The machine is a triplane with wings of R.A.F.15 section, loaded to approximately 9 lbs. per sq. ft.

The ribs are of standard type, made of spruce, and weigh on the average 2 lbs. 3 ozs. per rib. They are spaced 15 ins. apart with two intermediate nose riblets. The leading and trailing edges are of wood.

With spars of the dimensions necessary for a machine of this size, it is difficult to make them of the box construction adopted on most other large machines, because the sides of such boxes, to take the loads economically, would be so thin that there would be a great risk of local buckling. Consequently, a new type of construction has been used.

The spar consists of two Warren girders displaced relatively to each other. The detailed construction is clearly shown in the accompanying sketch. It is evident that with this construction short lengths of timber can be used to the best advantage. The tail plane spars, fuselage longitudinals and formers are all constructed in a similar manner.

It is estimated that these spars are some 10 per cent. lighter than a corresponding box section, because for practical reasons the sides and flanges of the boxes cannot be made thinner than 5/16 in.

This construction lends itself very well to fitting packing blocks for the clips, and also to the fixing of the ribs. The latter are attached by means of tongues which pass through the spar and thus transfer the shear from the ribs to the spar without any risk of the flanges of the former pulling away from the latter

The interplane struts, which are of built-up Oregon pine, are of a square section, faired off to streamline section with plywood. All interplane struts, except the sloping centre section struts, are of similar construction.

Few fittings in the wings embody any special feature, the only unusual detail being the method adopted for taking off the incidence wires. This is done by means of a kind of box with a central web, the latter forming the lug for the fork end.

Ailerons.

The ailerons are fitted to the centre plane only, and are approximately 100 sq. ft. each, are of a balanced type, the balanced portion extending the whole length of the aileron, which is about 23 ft. in length. To reduce the chord of the aileron a false spar is overhung from the main spar with stout box ribs projecting to take the hinges. The chord of the ailerons is 3 ft. 9 ins., and the hinge line is 9 ins. inside the leading edge of the aileron.

Fuselage.

The fuselage is of a monocoque construction, and is attached to the wings between the middle and bottom planes. The centre sloping struts, which are a pair of steel tubes faired off, pass straight through the body, and the side loads are taken off these struts at the top of the fuselage by inclined struts running to the junction of the engine struts and the centre plane, and at the bottom by wires to the bottom of the engine struts. Two pairs of specially stout rings are built into the body where these struts pass through it, and thus the loads here are distributed over a large area.

The body is built up on a series of main rings made on a system similar to that used for the spars, with intermediate series of lighter single rings or formers. Longitudinals run from the nose to the tail of the body and are constructed in such a way that neither the rings nor the longitudinals are cut away where the two intersect To get a flush surface on the outside the longitudinals are packed up level with the flanges of the braced rings. The method used is shown in a sketch.

Over the parallel portion of the body the longitudinals are built up like the spars, but aft of this the inner flange of the longitudinal tapers down and forms a single member which extends to the end of the body.

The skin is made of two-ply. This is built on formers in four quarter rounds, the thickness varying from 5 m/m. to 3 m/m. The four sections are scarfed together and the whole skin is screwed to the longerons, formers and rings, and covered with fabric, varnished and enamelled.

Most of the petrol is carried in the body in tanks at the sides and top of the fuselage, leaving the centre of the body clear.

Controls.

The controls are duplicated throughout, with two rudder bars, and two aileron and elevator controls side by side. Immediately

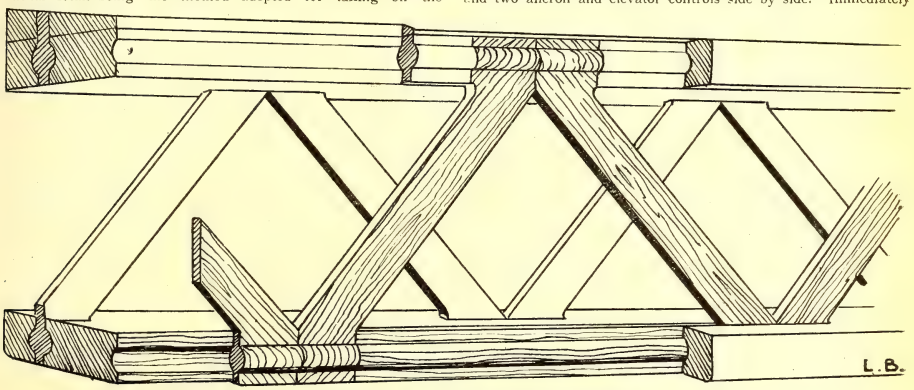
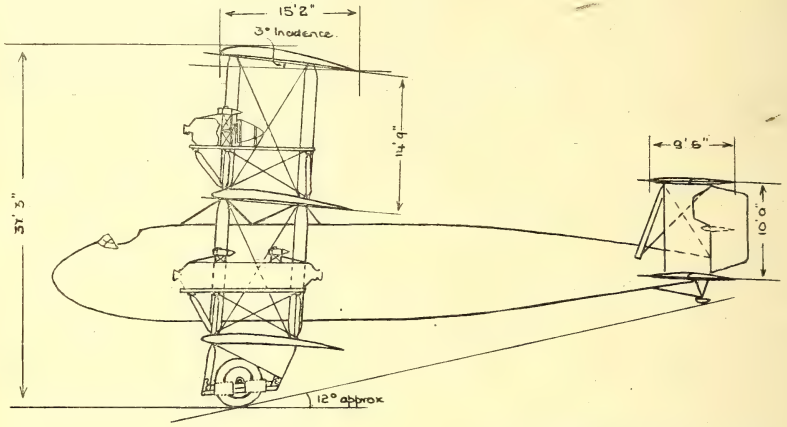
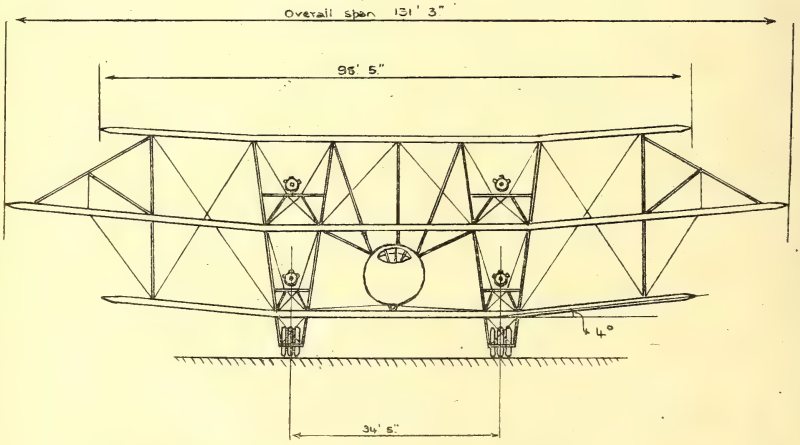


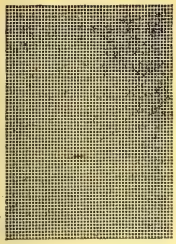
Diagram of the Tarrant Spar Construction.



~ TARRANT ~
TRIPLANE.
6-500 HP NAPIER-"LION".



LEONARD BRIDGMAN



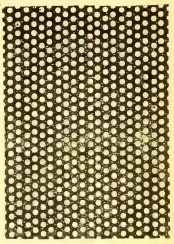
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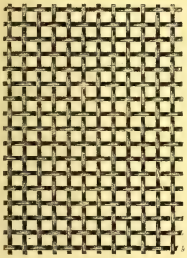
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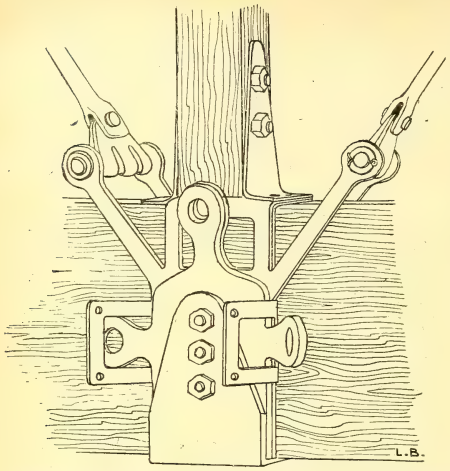
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SHEFFIELD.



A Typical Tarrant Wing Fitting, in this Case for the Bottom Central Strut.

behind the pilots is a partition which carries all the engine controls, and at the bottom of this board are two collecting tanks for the petrol systems for the upper and lower engine systems respectively. This partition forms the front of the engineer's cabin, and in the rear of this under the floor is the main petrol collecting tank, through which all petrol from the main tanks passes on the way to the engines.

The engines can be started from the cockpit by the Napier system, which has already been described in The Aeroplane.

Tail Unit.

The tail unit is of the biplane type with an inter-elevator fitted between the planes, and immediately below the main elevators. The inter-elevator, which is a balanced surface, is connected to the lower elevator, also balanced, by means of struts. These two are connected to the control column.

For trimming the machine, the top elevator is connected to a pair of inter-connected hand wheels in the pilot's cockpit, which are situated one on the outside of each pilot's seat.

The interplane struts on the tail plane form the structure for the two fins behind which are fixed two balanced rudders.

Tail Skid.

The tail skid consists of a large shoe connected by means of a rubber shock absorber to four struts at the end of the fuselage which form a base for attaching the rubbering.

Chassis.

The chassis consists of two separate units, each placed below the engines. There are three wheels on each axle, the axle being carried at the centre of a beam built up of platework and attached to another beam of similar construction, which forms the lower member of the chassis structure, by means of the shock absorber.

Engines.

The six engines, each a Napier "Lion" of 500 h.p., are arranged as follows:—

One set of two in tandem with tractor and pusher airscrews are mounted on each side of the fuselage between the bottom and middle planes, and two single engines driving tractor airscrews are carried vertically above the tondem engines between the middle and top planes. All engine bearers and mountings are made of spruce.

The tractor airscrews are two-bladed, 12 ft. 6 ins. diameter, and the pusher airscrews are four-bladed, 10 ft. 7½ ins. diameter.

Each engine is fitted with two magnetos, the earth wires for each magneto being carried straight to a double switch on the engineer's control-board. From these switches leads are taken to a master-switch in the pilot's cockpit, by which the whole 12 magnetos may be cut out at once.

The radiators are situated under the engines, and are fitted with radiator shutters to control the temperature of the water.

The machine is so designed that with full load a speed of over 90 miles per hour can be obtained with two engines cut out, and as starting devices are fitted in the cockpits and as the engines can be started in the air, it is possible to alternately have two engines stopped, or just "ticking over."

Fully loaded, the machine weighs approximately 45,000 lbs. Of this 19,000 is disposable load. Tanks are fitted for 10,000 lbs. of petrol, leaving 9,000 lbs. available for passengers and cargo.

Performance.

With this load, and under full power, it is estimated that a speed of over 110 m.p.h. will be obtained and that a ceiling or "maximum height obtainable" of 13,000 feet can be reached.

The estimated figures of climb are as follows:—

Climb to 5,000 feet in 10½ minutes.
Climb to 10,000 feet in 33⅓ minutes.
Climb to 13,000 feet in just over one hour.

The 10,000 lbs. of petrol is sufficient for 8 hours' flight at an average speed of 113⅓ m.p.h. or a distance of 900 miles. If the engines be throttled down, or only four engines used at once, the duration can be increased to 12 hours at an average speed of 91⅔ m.p.h., giving a range of 1,090 miles. By still further throttling down, and flying at the "cruising" or most economical, speed, a distance of 1,200 miles can be covered.

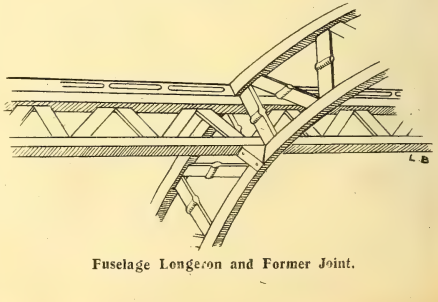
General Specification.

The following is a detailed list of the leading dimensions and weights:—

Engines.—Six 500 h.p. Napier "Lion."
Span.—Middle plane, 131 ft. 3 ins.; top and bottom plane, 98 ft. 5 ins.
Total Surface of Wings.—4,950 sq. ft.
Overall Height.—37 ft. 3 ins.
Overall Length.—73 ft. 2 ins.
Body—Round Streamline.—Maximum diameter, 11 ft.
Gap (Top and Middle Planes).—14 ft. 9 ins.
Gap (Middle and Bottom Planes).—14 ft. 9 ins.
Chord.—15 ft. 2 ins.
Dihedral.—4 degs. on all planes.
Area of Ailerons—on Middle Plane only.—105 sq. ft. each = 210 sq. ft. total.
Area of Fin.—42 sq. ft. each; total, 84 sq. ft.
Area of Rudders.—31 sq. ft. each; total, 62 sq. ft.
Area of Tail Planes.—184 sq. ft. each; total, 368 sq. ft.
Area of Elevators.—81 sq. ft. each; total, 162 sq. ft.
Area of Inter Elevator.—54 sq. ft.
Span of Tail Planes.—30 ft.
Gap of Tail Planes.—10 ft.
Wings are set at 3 degs. to the body.
Top tail plane at 2 degs. to the body.
Bottom tail plane at 0 deg. to the body.

Weights.

	lbs.	
Top plane	1903	
Bottom plane	2691	
Middle plane	1833	
Interplane struts	2543	
External bracing wires	608	
Total		9578 lbs.
Tail planes	334	
Elevators	117	
Fins	98	
Rudders	40	
Total		589 lbs.
Fuselage (including bomb girders)	3590	
Chassis	2582	
Tail skid	60	
Controls	501	
Total		6733 lbs.
Engine, propellers, radiators, water, etc.		7200 ,,
Engine accessories		650 ,,
Petrol and tanks (1600 galls.)		12662 ,,
Oil and tanks, etc. (92 galls.)		1050 ,,
Crew (five)		1080 ,,
W.T.		100 ,,
Guns and ammunition		380 ,,
Bombs and gears		4650 ,,
Total		44672 ,,



Fuselage Longeron and Former Joint.

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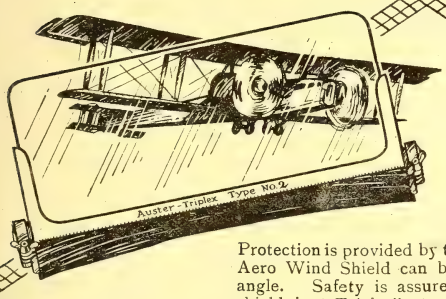
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For compactness, strength and lightness this famous Aero Shield is a worthy product of the House of Auster—pre-eminent in Wind Shields for Aeroplanes, Seaplanes, Flying Boats, Motor Boats, Motor Cars, etc.

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Weekly output
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give them
FLUXITE
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WHEN it comes to mending Pots Pans and other metal articles, and you cannot get it done by "the man round the corner," do it yourself—with FLUXITE of course—it's quite a simple operation. You need spend very little time cleaning and scraping, for FLUXITE solders even dirty metals—and makes a better job of it every time. Mechanics will have FLUXITE in it
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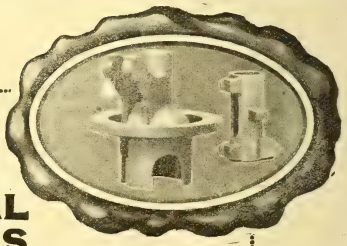
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THE AIRCRAFT TRADER

MARKET TOPICS.

Prices are for Quantities on Usual Terms.

May 8th, 1919.

COPPER.—This market is very quiet since the holidays, and although there has been a little activity this week, business is far from brisk. Prices are, however, fairly firm, but there is not much confidence being shown. The present level of prices for Ingot Copper is fairly reasonable, and there does not appear to be any reason why buyers should not begin to make larger purchases; there is a slight increase in the demand, but nothing worth speaking about, and it is reported that U.S.A. producers have reduced their production to about 30 per cent. There does not appear to be anything to gain by waiting. On the other hand, there are indications that the market will harden within the next two or three months.

The position in U.S.A. is very dull, and although some buyers have been in the market, the quantities bought were very small, and consumers are still buying hand-to-mouth. An American report states that it was expected that when business has been resumed with the Central Powers, their approximate requirements will be about 10,000 tons per month. It is also reported that the French Government's prohibition against metal imports has hindered credit facilities up to $50,000,000 being accepted from America by certain French interests.

The last report of Government stocks shows a reduction of 2,600 tons; it is certainly not satisfactory, as it was reported that consumers had taken large quantities.

Comparative Prices.

	Per Ton. £ s. d.
To-day (May 7th)	76 10 0
Last month	79 5 0
Highest price, 1918	122 10 0
Lowest price, 1918	100 0 0

TIN.—This market is not quite so sensitive, but lacks activity. The Eastern situation is being eagerly watched, and it is rumoured that business has been transacted in U.S.A., and although the American embargo on imports has not been lifted, it is quite possible that American buyers have been making purchases in anticipation of the removal of the restrictions. The situation generally is not very satisfactory, and although prices continue fairly firm, the outlook is not very certain.

Comparative Prices.

	Per Ton. £ s. d.
To-day (May 7th)	228 15 0
Last month	227 2 0
Highest price, 1918	399 0 0
Lowest price, 1918	240 0 0

LEAD.—Recent arrivals have been fairly large, and although the market is not very brisk, buyers are more in evidence. The consumption of Lead is apparently increasing, and the next Government stock report is awaited with interest. The general condition of the market is fairly satisfactory and shows signs of stability.

STEEL.—Prior to April 30th, this market was in a state of stagnation, owing to the uncertainty of prices due to the withdrawal of all subsidies in connection with the manufacture of Iron and Steel, including all Iron Ore, Coke and Pig Iron, and the cessation of the control of prices and allocations of all descriptions of Metallurgical Coke Iron, Steel Scrap, Cinders, Scoll, Iron Ore, Pig Iron, Manufactured Iron and Steel Tinned Plates, which ceased on that date.

It should be stated that the subsidies in question have caused the prices of Pig Iron, Manufactured Iron, and Steel to be restricted to prices which are less than the actual level at which they would have been sold. Steps were taken by the Ministry to prevent hoarding of subsidised material, and no maker, merchant or other stockholder of any description holding stocks at April 30th, which exceed 100 tons more than the stock held by them on Oct. 31st, 1915, or Oct. 31st, 1918, whichever is the greater, will be compelled to pay to the Ministry a drawback of 30s. per ton.

It was expected in some quarters that the price of Steel would be advanced approximately £5 per ton. However, the advance is only £2 10s. to £3 per ton, and, even then, it will have a serious effect on the Steel market, and it is practically certain that it will result in bringing business to a standstill; in fact, certain influential authorities are already predicting that prices must come down. If they do not, it is difficult to see how Steel makers and firms manufacturing finished articles from Steel can avoid losing a very large amount of business.

The latter can, of course, buy from U.S.A.; in fact, it is stated that one order for 1,000 tons of Steel has already been accepted by an American firm, and it is also reported that some of the rolling mills intend buying billets from U.S.A., the assertion being made that the price is approximately 30s. per ton cheaper than the price quoted here.

It will be seen from the foregoing that the position is anything but satisfactory, and at present very little business is being done. It is even suggested that it would do no harm to have an inquiry into the prices of Steel on the lines of the Coal Commission. This suggestion certainly commends itself, and if the country is to maintain its export trade, and also capture the trade which, prior to the war, went to Germany, one of the necessary steps will be the adjustment of Steel prices to enable firms to meet competition, particularly American.

Very little business is being done in High-speed and Crucible Cast Steels, as the stocks which the majority of firms held are only being absorbed, as very few are working "all out" on their Peace programme.

No official notification has been received that official prices for Aircraft Steels have been withdrawn, and some definite information should be circulated, throwing light on this point. For the time being the official prices of Alloy Steels to Air Ministry Specifications are quoted in the monthly price list.

TIMBER.—Prior to the holidays, the Timber market was in a state of stagnation, and buyers were holding aloof, evidently expecting a still further decline in values. Since then, however, there has been a little more interest shown, and although prices may decline a little further, it is more likely that the market will begin to harden.

This is undoubtedly the case with Mahogany and Walnut. Although, in some quarters, there is an idea that there will be a further decline in value, there is not much ground for this expectation, as the demand is undoubtedly on the increase, and as soon as the Timber-consuming Industries are working on their full scale Peace programme, the demand will be very considerable, and it must not be forgotten that it is still very difficult to obtain shipping facilities, and there does not appear to be much prospect in the near future of this difficulty being overcome.

In fact, the general opinion is that it will be some considerable time before the position is easier. This means that the demand will be greater than the available supply, and the result will be a general stiffening in values.

It has been announced by the Board of Trade that the Controller of Timber Supplies does not require firms to make the monthly return of Timber stocks, the order under which these returns were made having been cancelled as from March 31st; no returns are required after the end of March.

There are very large stocks of Silver Spruce in the country, and it is expected that they will be put up for sale during this month. Intending buyers should be very careful indeed, as some of the Timber which has been purchased by the Government buyers is of very bad quality, and is perfectly unfit for aeroplane construction.

FABRIC.—It is difficult to understand why the Air Ministry are taking such a long time to inform the public what they intend to do with the huge stocks of Fabric which were purchased for aeroplane construction. It must also be noted that they have not officially withdrawn the fabric control, and it is, therefore, assumed that constructors must still make application to the Air Ministry for any supplies they require, presumably, at the official price which has been ruling for some time.

This appears to be very unsatisfactory, seeing that some merchants have been purchasing Fabric at approximately 1s. 6d. per yard, and are quite prepared to sell the material to aeroplane constructors at anything from 1s. 8d. to 2s. 3d. per yard.

Although the Air Ministry have not officially withdrawn their control from Fabric, there does not appear to be any reason why constructors should not avail themselves of offers of this description, assuming, of course, that the Fabric is of suitable quality and will pass inspection. It must be admitted that some of the material is not quite up to the Government standard, and care must be exercised in making purchases.

THE MONTHLY MARKET PRICE LIST.

May 8th, 1919.

The prices given below are the prices ruling on the above date.

Aluminium.

Ingot ..... £150 per ton.*

Brass.

Sheets ..... 13⅝d. per lb.
Strip ..... 11⅛d. per lb.
Wire ..... 12d. per lb.
Tubes ..... 14¼d. per lb.
Castings ..... 14d. per lb.
Turning Rod ..... 9½d. per lb.
Brazed Tubes ..... 15¾d. per lb.

Copper.

Ingot, Standard, Cash ..... £76 per ton*
Ingot, Standard, 3 mos. ..... £76 5s. per ton.*
Best Selected (Net) ..... £81 per ton
Sheets ..... £114 per ton
Wire ..... 11d. per lb.
Tubes, S.D. ..... 15¾d. per lb.
Tubes, Brazed ..... 15¾d. per lb.
Rivets ..... 1s. 9½d. per lb., basis.

Fabric.*

Linen, R.A.F., 17C, Spec., 36 in. wide, 3s. 1d. p. yd.
Linen, R.A.F., 17C, Spec., 38in. wide, 3s. 3d. p. yd.
Linen, R.A.F., 17C, Spec., 42 in. wide, 3s. 7d. p. yd.
Spaced, R.A.F., 17C, Spec., 37½ in. wide, 2s. 1d. p. yd.

Gun Metal.

Castings, Plain ..... 1s. 7d. to 2s. per lb.

Lead.*

Virgin Pig ..... £24 per ton, c.i.f.
Virgin Pig ..... £25 per ton, ex stores.
Sheets ..... £39 per ton, D/d.
Pipes ..... £39 10s. per ton.
Dry White ..... £51 per ton, less 5 per cent.
White in Oil, Grnd. ..... £61 15s. per ton
(lots over 5 cwt. less 5 per cent.)
Red ..... £45 10s. per ton, less 2½ per cent.

Nickel.

Nickel ..... £195 per ton.

Phosphor Bronze.

Ingots, 5 cwt., and under ..... £122 to £145.
(Subject to Copper and Tin Fluctuations.)
Castings ..... 1s. 3d. to 1s. 6½d. per lb.

Phosphor Copper.

Ton lots ..... £140 to £146

Silver.

Silver ..... 48 11-16d. per oz.

Solder.

Plumber's ..... 100s.
Tinman's ..... 126s.

Steel.

High Speed, 14 p. cent., Tungsten, 3s. 4d. p. lb., basis*†
High Speed, 18 per cent., Tungsten, 3s. 11d. p. lb. basis.

Alloy Steels to Air Ministry Specifications.

Round and Square :—

Specification No. S2 ..... £86
Specification No. S2 (bright-drawn) £115
Specification No. S8 ..... £86
Specification No. S10 ..... £70
Specification No. S12 ..... £75
Specification No. S14 ..... £43
Specification No. S15 ..... £70
Specification No. S16 ..... £70
Specification No. S17 ..... £75
Specification No. S18 (oil-hardened) £86
Specification No. K1 ..... £75
Specification No. K2 ..... £75
Specification No. K3 ..... £86

The above prices are for ¼ in. to 5/16 in. only, other sizes are proportionate.

Hexagons.

	.455 and .525	.601 and .710
Specification S2	£79	£77
Specification S8	£79	£77
Specification S2 (bright-drawn),	£112	£112
Specification S8 (bright-drawn),	£112	£112

Spelter.

English f.o.b., Birmingham ..... £35 5s.

Tin.

Tin £227

Tinplates.

Tinplate ..... 35s., basis, f.c.t.

Timber.

	Merchantss.
Silver Spruce	10s. 4d., c.f.†
English Ash—	
Selected Logs	7s. 6d., c.f., f.o.r.
Selected Lengths and Thicknesses of Plank	10s. 6d., c.f., f.o.r.
Mahogany	1s. 3d. to 2s.
Walnut	1s. 6d.

Zinc.

Zinc sheets (America), £65 to £70, f.o.b., New York.

Scrap Materials (London Prices).

Description.	Price per ton.
Aluminium	£70 0 0
Brass, Heavy Selected	58 0 0
Copper, Clean	74 0 0
Copper, Brazing	62 0 0
Gun-metal, Scrap	72 0 0
Lead, no Draft	22 0 0
Zinc, Old	27 0 0

* Official Prices. † Includes Parcel Inspection only. ‡ Prices include Delivery in the U.K.

CANCELLATION OF CONTRACTS.

An official report from Washington gives the following summary of the values of cancellations and suspensions of contracts up to March 22nd, 1919 :—

	Value. Dols.	Per cent. of total.
Engines and spare parts	266,961,771	54
Aeroplanes and spare parts	165,228,590	33
Chemicals and chemical plants	18,648,239	4
Instruments and accessories	10,761,081	2
Balloons and supplies	10,071,035	2
Fabrics, lumber and metals	7,977,445	2
Miscellaneous	13,034,218	3
Total	493,342,379	

NOT A PENNY-A-LINE AIR LINE—ONE HOPES.

The following announcement has been received from America. Unfortunately, the company have not made it clear whether they refer to an aeroplane or an airship.

The Lawson Air Line Transportation Company has just been incorporated under the laws of the State of Wisconsin for the purpose of manufacturing and operating a passenger-carrying aircraft. Alfred W. Lawson, the general manager of the Lawson Aircraft Corporation, of Green Bay, Wisconsin, has been elected President of the Company.

A plant has already been secured in Milwaukee, and work is now being carried out on a new ship that will sarry 20 passengers. This has been designed and is being built under the direction of Mr. Lawson. It is expected that the new ship will be ready by July 1st.

It is Mr. Lawson's intention to operate a regular air line service between Chicago and New York to begin with and later on to extend this line from Chicago to San Francisco, thereby making a trans-continental route for Commercial aircraft transportation.

STARTING AND LIGHTING BATTERIES.

The Hart Accumulator Company, Limited, of Stratford, have just issued an illustrated price list of Starting and Lighting Batteries for motor-car work. These batteries are made up in standard sets for 6 and 12 volts, and in sizes the overall dimensions are such that they are interchangeable with the starting batteries fitted to most American-made cars.

In addition to the standard sizes, special batteries can be made up to order.

A very complete list of spare parts for the standard batteries is included in the list.

The firm will be pleased to forward a copy of the list to any reader of The Aeroplane who is interested. The firm's address is :—The Hart Accumulator Company, Limited, Marshgate Lane, Stratford, London.

THE TOOLS OF THE TRADE.

Those readers of The Aeroplane who are interested in draughtsmanship will be pleased to learn that the American Lead Pencil Co. has now put on the market the "Venus" Tracing Cloth Eraser, which shows good results. Full particulars can be obtained from 173/5, Lower Clapton Road, London E.5, or the erasers can be obtained from most stationers and drawing office suppliers.

THE RESIGNATION OF MR. W. E. CHESTER.

It is announced that Mr. W. Ewart Chester, F.R.G.S., who was the founder of the firm, has resigned his position as managing director of the Davidson Aviation Co., Hammersmith, W., in order to enter the motor-car business, and with this object in view he is developing a site at Hill Street, Richmond, to be known as the London Automobile Co., with a West End branch for the sale and distribution of motor vehicles, etc.



Why does the farseeing Aeroplane Builder think of

"DOPE"

AND

"CELLON"

at one and the same time?

This is a riddle which requires no guessing. The answer is obvious. "CELLON" is

"THE DOPE OF PROVED EFFICIENCY."

Proprietary Doping Schemes for Commercial Purposes.

Standard Dope for Air Ministry Contracts.

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ENGINEERS, LONDON.

"GWYNNE, LONDON."

COMMERCIAL AERONAUTICS & CIVIL AERIAL TRANSPORT

PUSSIGRAMS, ETC.

By "MEDWAY."

Mr. Holt Thomas is a man of many ideas, the latest of which is, I believe, the "Aerogram." It appears that the aerogram is a message delivered in three stages. It is conveyed from the sender to a neighbouring aerodrome by telephone; it is then put into writing and is conveyed by aeroplane to a second aerodrome situated conveniently near to the point of destination. The third and last stage is the final transmission of the message by telephone from the second aerodrome to its destination.

Let us examine the process critically.

During the first stage there is the possibility of delay owing to congestion on the telephone lines leading to the aerodrome and owing to the vagaries of telephone operators. There is also a risk that the message will be taken down incorrectly by the operator at the aerodrome. We all know how easy it is for a verbal message to become distorted. I remember, for instance, the telephonic communication to a technical paper of an item of news to the effect that the county surveyor had purchased a steam roller for use in some particular district. The paper attributed the purchase to the Countess of Ayr, and commented favourably upon her generosity and public-spirited action.

A Mutilated Message.

Again, one has heard stories of the distortion of verbally transmitted messages at the front. There was, for example, the case of the officer in the front lines who sent back the message, "Send reinforcements; am going to advance." This reached headquarters in the form of "Send three and fourpence; am going to a dance."

These little examples may serve to show what might possibly happen to an aerogram during the first stage of its transmission. Exactly the same possibilities recur during the third stage.

The message, having reached the first aerodrome, is written down in handwriting which may or may not be strictly legible. At this stage we have at least a short delay. We obviously cannot dispatch an aeroplane immediately to convey one message. In fact, a reasonable aerogram service could only be justified if the number of messages handled were very large. Mr. Holt Thomas suggests an hourly aerial service between London and Paris. Under this arrangement there would be an average delay of rather over half an hour at the first aerodrome. This estimate takes no account of irregularities of service due to unfavourable weather or other causes.

Difficulties.

The duration of the second stage, assuming freedom from delays or accidents, would be in direct proportion to the distance to be covered. On arrival of the aeroplane at the second aerodrome, the messages must be sorted out and dealt with in rotation. Several hundreds of messages could not all be transmitted to their recipients simultaneously and immediately. Here again there would consequently be a delay which would certainly average at least half an hour.

At this point we have the possibility that the operator entrusted with the final telephoning of the message will mis-read it. As already mentioned, we also have the possibility that the man at the other end will take it down incorrectly.

Thus the whole process appears to be one which involves a series of delays, inevitable if not lengthy, and a number of opportunities of distorting the message so as to make it unintelligible or misleading. The system is obviously one which no one would dream of using for short-distance local work. Over very long journeys, indeed, it could not compare with the cable system for speed. In intermediate cases its popularity would hinge entirely on the inefficiency of the cable communications. If the cables were not overworked, they would be quicker as well as more direct.

Rivals in Speed.

The reader will probably have gathered from the above remarks that I have no very high opinion of the prospects of the aerogram as a direct competitor of the cablegram or the long-distance telephone. The proposition is not on all fours with that of the aerial post to foreign countries. The latter would make no pretensions to rival the cable in the matter of speed. It would merely afford a means of communication intermediate between the cable and the ordinary mail service in respect both of speed and of cost.

In this intermediate capacity it has an obvious and legitimate sphere of usefulness. Moreover, the aerial post would allow of the rapid transmission of signed documents. The aerogram system in this respect would have no advantage over the telegram or telephone. It could not be used for the legal completion of any contract.

In short, the aerogram idea strikes me as being far-fetched, and I have not dealt with it at so much length on its merits, but rather as an example of a principle which appears to me to be faulty.

When we have something new and useful put at our disposal, it is wisest in the first instance to employ that thing, whatever it may be, for the purposes to which it is obviously best fitted. It seems to me that it is a mistake to hunt around for some oblique and doubtful sphere of utility.

A Use for the Harmless, Necessary Cat.

For instance, the average man who owns a cat keeps that animal either because it looks comfortable, or else on the supposition that it will catch mice. Probably this supposition is all wrong, but, if the cat is too well fed to hunt, there is still a good chance that mice will keep away from its vicinity.

Now I can imagine an ingenious person contemplating his cat and evolving something on the following lines:

"The obvious uses of this cat are strictly limited; can I not think of some other use to which it can be put? Possibly I could get some hints from the Proverbs. We are told that a cat may look at a king, but there appears to be no commercial advantage that can be exploited as a result of this faculty. We are also

told that a cat has nine lives. This suggests its use for some purpose in connection with which comparative immortality would be of value. We know from hearsay if not from experience that a cat has a homing instinct; if he is removed from home he will find his way back.

A System of Pussigrams.

"Why should we not therefore evolve a system of pussigrams. Cat depôts could be established, let us say, in the neighbourhood of the Bank and of South Kensington Museum. Consignments of cats can then be delivered on the outward journeys at regular intervals. For example, a Bank cat will be supplied to South Kensington. An official of the Museum desirous of communicating with the Bank will attach his message to the cat and leave the door open. The cat will do the rest. On arrival at the Bank a clerk will detach the message and butter the cat's paws. Next day Carter Paterson will call and convey the reluctant cat back again to South Kensington."

I admit that this process is a somewhat complicated one. I have, however, myself dispatched a letter from South Kensington to the Bank which has taken not less than three days to reach its destination. A cat would obviously do the journey more quickly, barring accidents.

The fact of the matter is that most useful appliances, including aeroplanes and cats, can be best employed on their own obvious jobs, and not in an attempt to utilise their peculiar capabilities in strange and distorted ways. There are plenty of legitimate and evident openings for the commercial aeroplane, and we need not go out to hunt for queer uses for it, particularly as in so doing we are apt to give the impression that more obvious and tangible uses do not exist.

POST-BELLUM POLICIES.

By The Special Commissioner of "The Aeroplane."

Major Gordon Watney.

Major Gordon Watney is disturbing. I left him with the Labour and economic situations revolving round him in my head.

In discussing aeronautics these problems are bound to occur as they bear on the cost of producing aeroplanes on a commercial basis. If the initial cost of the machine be high, it follows that the rates chargeable must be correspondingly high, and the aeroplane suffers in competition with the already established routes.

Present-Day Difficulties.

So far, no one knows the working costs of an aeroplane line, and it is not in its favour to commence such an undertaking when labour and material are at their high water-mark, as is apparently the case at the present time. How long the situation will last is problematical, but its effect is bound to be felt, as it is almost sure to deter manufacturers from beginning commercial machine programmes, and the honest company promoter, if such there be, from applying his capital to the purchase of machines. Rather will they both wait until such time as the labour market settles itself on a reasonable basis, bringing with that the proper economic prices for materials.

Then the aeroplane will be built on its proper commercial and economic basis. What the period of time will be before all this occurs it is impossible to forecast. That it is delaying the development of the strictly commercial machine is evident from the reluctance of manufacturers to embark on any large experimental work, and the tendency to adapt machines designed for war to the necessities of peace.

Add to this the uncertainty of future Government regulations, and is it to be wondered that the trade marks time?

A Labour Storm.

Of the two, it is probable that the Governmental issue will be settled first. If the miners' action is but the wind before a labour storm, the delay caused to commercial ventures will be serious. Major Watney pointed out that the value of money has also to become settled, mentioning the ridiculous cost of cars and instancing some absurd cases of what members of the purchasing public are capable in the motor business.

The trouble is that these absurdities are so common that we all continue to hear of them from every side. Major Watney is very much afraid of excessive Government inspection, and says that it would hamper the development of the Industry immensely. He is more in favour of heavily penalising the contractor for any accidents occurring, which he believes would result in much greater business freedom, and, at the same time, ensure building to specification.

Working Expenses of Aerial Transport.

Reverting for a moment to the high labour costs; Major Watney considers that the working expenses of aerial transport companies will be out of all proportion to capital charges, engines repairs and overhauls he cites as being items that will figure largely therein, though war methods of affecting such repairs are no standard to take as an example.

He was illuminating on the latter subject, but it only touches the commercial question from the point of view of knowing what to avoid. Here his experience must be very complete. He says, too, that the speed of transport will be a dominating factor in aerially carried cargoes. For example, if a manufacturer can get his goods delivered in one-quarter of the time taken by other forms of transport, it will be a proportionate saving to him and to the person to whom the goods are delivered.

It really amounts to saving interest on capital lying idle, and also bringing it to an earning state so much sooner; these two points are not analogous, as the earning capacity of money represented by engines, for example, is higher than that of invested capital.

An Entirely False Demand.

Altogether, Major Watney makes one think of the whole question from the point of view of the business man, and in doing so forces realisation that the aeroplane trade owes its position to-day to an entirely false demand, and further, that prices for the finished article are the result of increased wages and material costs largely created by this very demand. Here, then, is an initial difficulty for this "short-clothes" Industry to overcome, and it is no easy one. Much depends on safe finance that its emergence from this and other difficulties shall be speedy and sound. If there is any slipshod element it is bound to set back development.

That there is an opportunity to be seized, no one doubts, but a large number of our builders have sprung into being during the days of the war, and it is only during those days that the pioneer manufacturers have succeeded in making profits in any way commensurate with their capital. Looking back at what it has come through in pre-war days, no one can doubt the vitality of this Industry, but it must adjust itself to new conditions. This may bring with it a number of failures; in fact, it probably will, and, I suppose, it will also end in the survival of the fittest.

Again, I do not hold the pessimistic views with regard to the life of aeroplanes that your Special Commissioner suggests, and, although it might be wise to write off 50 per cent. with our present knowledge, I think that 100 per cent. to be unnecessary.

He winds up by saying—"Taking it all round, it appears that the policy of the Nieuport Company is to be chiefly concerned with Military rather than Commercial Aeronautics," and, he adds, that it is apparent that it is from War machines "that the Company is expecting to make its profits in the future." Again, I should like to differ from the "new and original views" of your Special Commissioner, and if I may be allowed to so differ. I should like to express the hope that this Company may make quite reasonable profits out of commercial machines. Anyway, we are going to build a lot of commercial machines, and I am not a philanthropist, and I trust my Estimating Department is capable of performing its proper function.

(Signed) S. Heckstall Smith, Major.
General Manager, The "Nieuport" and General Aircraft Co., Ltd.

ERRATA.

Sir,—With reference to your article on the post-bellum policy of the "Nieuport" and General Aircraft Company, I presume the little rhyme at the head of the article refers to your Special Commissioner, as the "new and original views" are evidently his and not mine.

He suggests that this Company is going "to confine itself to land machines" and still further confine itself to "a semi-large machine" at that. This, I may say at once, is not my policy. To *confine* oneself to anything at this stage of Commercial Aeronautics would be somewhat short-sighted, to say the least of it, and, anyway, we are undertaking an active programme which covers a wide range from a single-seated machine at a very low price to two-seaters, four-seaters, and twelve-seaters, also at prices which will appeal to the buyer.

Why your imaginative Special Commissioner should think that I am not pleased at the prospect of turning to commercial machines, I cannot imagine, as, to my mind, there is no more attractive problem in Aeronautics than the development of the Commercial Industry.

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CIVIL AERIAL TRANSPORT NOTES.

United Kingdom.

Messrs. Leopold Walford (London) Limited, 29, Great St. Helens, E.C.3, have been appointed Official Freight and Passenger Agents by Messrs. Handley Page Limited for their Aerial Services to All Parts of the World. At an early date Messrs. Walford will announce full particulars of the various services and rates. The numerous organisations of Messrs. Walford in the United Kingdom, France, Canada, United States, Australia, India, Africa, Italy, Japan, China, South America, etc., will be at the service of the public in combination with their Shipping and Forwarding Offices.

Seven aeroplane manufacturers have applied to the Brighton Corporation for permission to ply for hire, with seaplanes and aeroplanes, from Brighton.

The matter is under the consideration of a committee (Aero Sub-Committee) composed of four members of the Council.

Among the applicants are the Gosport Aircraft Company and the Navarro Aviation Company.

The fuselage of the big Handley Page passenger aeroplane which was recently exhibited at Selfridge's has been taken to Southsea, where it is to be shown for the benefit of the Mayor of Portsmouth's War Memorial Fund. It is now understood that in the summer passenger flights will be made at Southsea by Handley Page machines.

One gathers that the Hendon Aerodrome has now been vacated by the Royal Air Force and handed back to the Grahame-White Company, Ltd. The Communication Wing for the Peace Conference has been transferred to Kenley Aerodrome, Surrey.

On May 6th a Handley Page aeroplane, piloted by Lieut.-Col. Douglas, R.A.F., and Lieut. Warneford, R.A.F., left Turnhouse Aerodrome, west of Edinburgh, for Manchester. Mr. Blackwood, the publisher, was a passenger. Owing to adverse weather the machine was unable to fly beyond Penrith, where a landing was made.

Colonel Douglas is stated to have said that he did not think business flying would ever be carried on north of the Forth, owing to the unsuitability of the mountainous country for forced landing purposes.

At a meeting of the Blackpool Town Council on May 6th, Alderman Thos. Bickerstaffe objected to the public being barred from parts of the beach, in order that aircraft may alight thereon. Alderman Heap said that eventually a proper aerodrome would be provided, and that the firm, which is to begin a flying service from this town on May 10th, have been entrusted with this matter. An amendment referring the matter back was defeated.

During the past week copies of the "Daily Mail" and "Evening News" have been dropped from a Handley Page biplane every day by parachute at various coastal and inland towns. The list of these places includes:—Southend, Margate, Broadstairs, Ramsgate, Deal, and Folkestone for the "Evening News," and Southampton, Bournemouth, Ryde, Portsmouth, Eastleigh, Cardiff, Swansea, and Bristol for the "Daily Mail." The Manchester edition of the "Daily Mail" was taken to Carlisle and Edinburgh by aeroplane on May 8th.

Three occupants of a Handley Page machine, carrying newspapers from Manchester to Scotland on May 12th, met with a mishap some miles north of Carlisle at Harker. The machine had descended owing to engine trouble, but later an attempt was made to resume the flight. In rising the machine struck a bank, and nose-dived into the ground.

The pilot, Capt. William Shakespeare, R.A.F., of Worcester, suffered a crushed lung and extensive bruises, and since his removal to a nursing home at Carlisle it is reported that hemorrhage has developed. The observer, Major Orde Lees, R.A.F., was removed to Fuschill War Hospital, and the other occupant, Miss Boyden, had her lip cut and front teeth knocked out.

On Saturday, May 10th, there was inaugurated a passenger aeroplane service between Manchester and Blackpool. Four Avro machines, having for passengers members of the Blackpool Corporation, left the Alexandra Park Aerodrome, Manchester, late in the afternoon, and the "trial trippers" were treated to a perfect and uneventful journey, arriving in Blackpool in about 40 minutes. They passed over Southport during the trip.

A good crowd assembled at the aerodrome, special permission having been granted to allow the public to have a fair view of the operations.

The four machines got well away, but one had to return on account of engine trouble. A fresh start, however, was made without further mishap.

The party consisted of Councillors Bean, Boden, and Seigenson, the Town Clerk (Mr. Harbottle), and Mr Pringle (the Chief Constable). Mr. Lord, director of the Avro firm, accompanied the party.

The return journey was completed uneventfully.—J. G. B.

During the week-end a good number of flights were made both from Hounslow and Hendon. A. V. Roe and Co., Ltd., at Hounslow made a charge of half a guinea for flights, and the Grahame-White Company at Hendon made the same charge.

The first commercial aeroplane to reach Leeds arrived at Roundhay, outside the city, on May 10th. The machine, a Blackburn aeroplane, was piloted by Mr. R. W. Kenworthy, a well-known Yorkshire pilot. He had flown from Portsmouth to Hounslow in 40 minutes, and from Hounslow to Leeds in an hour and three-quarters, carrying goods for the Blackburn Aeroplane Company.

It is proposed to have "an aeroplane week" at Tunbridge Wells, when residents will be afforded the opportunity of making flights.

Canada.

Mr. Grant Hall, vice-president of the Canadian Pacific Railway, explaining the reasons of the company's application for an Air Charter, said:—

Although at present aerial transport is a distinctly expensive matter, the progress that is being made, both in aeroplanes and dirigibles, is so rapid that a company such as the Canadian Pacific should be ready to enter the field as soon as air transport comes within the range of practical politics. Although there are areas in Canada which will for a long time present difficulties, particularly to air pilots, there are other areas which conform to the requirements of experts. Take, for instance, the Western prairies, which offer the conditions described by General Seely as vital—namely, regions where there is plenty of wide space combined with almost complete absence of the airman's real enemies, mist and fog. In such districts air travelling might be made profitable.

The first aerial transport company began business at Vancouver on May 9th. A landing-ground of 26 acres has been obtained and sheds been erected. Three two-seater machines are available for pleasure and commercial flights. The pilots and mechanics are ex-R.A.F. men.

Australia.

A private firm at Melbourne has instituted daily aeroplane flights, passengers paying from three to five guineas for the flight. Flying instruction classes are being formed.

Germany.

A flight has been made from Berlin to Copenhagen, and thence to Stockholm, by the first German passenger aeroplane, piloted by Herr Sablatnig, who will be remembered as one of the earliest aeroplane constructors in Germany.

Herr Sablatnig recently flew from Copenhagen to Johannisthal (near Berlin) in two hours and twenty-four minutes.

Italy.

Permission has been obtained from the Director-General of Aeronautics to introduce a postal service Rome-Naples-Foggia-Brindisi. The service between Naples and Brindisi will be run in order to connect with the steamers from Macedonia and the Levant, and it is not considered desirable to take ordinary correspondence by this means of transport, which will be limited to express and official correspondence.—T. S. B.

Scandinavia.

The first aeroplane to fly from Holland to Denmark arrived at Copenhagen at 5.40 p.m. on May 4th, having started at 10.30 a.m. the same morning. The machine, a seaplane, with Lieutenants Backer and Bakker on board, made one descent on the sea during its journey.

A committee has been appointed by the Swedish Government to inquire into the steps to be taken to establish a regular aerial service.

Brazil.

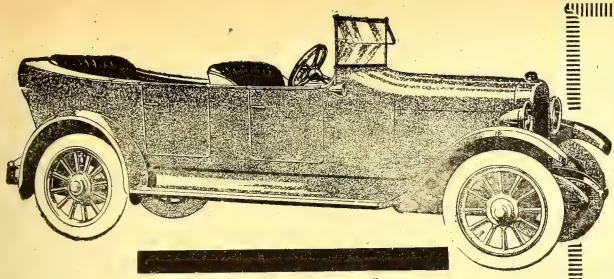
According to a Reuter's message dated April 25th a decree authorising the establishment of aerial transport lines has been signed. The decree allows goods and passengers to be carried between Brazil and other countries. Monopoly is not to be allowed. It is understood that an Italo-Brazilian company has submitted suggestions for various aerial routes radiating from Rio de Janeiro. Rio Grande de Sul and the State of Amazonas will be served.

A COMPLIMENTARY DINNER.

Sir Samuel Waring is to be entertained by the staff of Messrs. Waring and Gillow, Ltd., at a complimentary dinner, at the Connaught Rooms on May 16th, to mark the honour recently conferred on him by the King.

AERIAL TOURS.

Thomas Cook and Son are issuing a booklet entitled "Aerial Travel for Business and Pleasure," in which the firm announce their appointment as official passenger agents for the principal companies operating aerial lines. Some interesting "Notes on Passenger Aeroplanes" contained in the booklet are illustrated with photographs of Handley Page, Grahame-White, and Aircraft Manufacturing Company's passenger machines.



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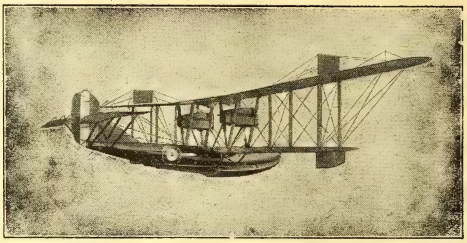
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AIRCRAFT FINANCE

THE BUDGET AND AVIATION.

The Chancellor of the Exchequer did not breathe a word on the subject of aviation or the Aircraft Industry in his memorable Budget speech. One need not shed crocodile tears at this slight, as the brewers and distillers are doing because they imagine they have to pay for the war, which aircraft also helped to win.

The Excess Profits Question.

However, the petrol nuisance has gone; the import of magnetos is still prohibited; and the Excess Profits Duty is reduced by one-half of the former maximum scale. The petrol question is important in a way, and the magneto business significant politically; but the fact that Colonial Preference is to be initiated—which is essentially a new and important departure in State economics—provides plenty of scope for a discussion of the Excess Profits Duty, and other things.

Preference.

If there is to be Colonial Preference in respect of ordinary trade, why not a revision of the principle governing the taxation of domestic industry? Preferential treatment might be accorded advantageously to those young and new industries which, in spite of—or because of the war—have secured a real foothold on the commercial world.

Charity Begins at Home.

Admittedly there may be a big gulf between tariff questions and preferential treatment for any individual group of industries; but the underlying principle is really the same. Indeed, as charity should begin at home, a case for preferential treatment of the Aircraft Industry is somewhat parochial in some aspects, and is not difficult to substantiate.

Preferential Treatment for Aircraft.

Under the present scheme certain industries are granted concessions in respect of the incidence of the Excess Profits Duty. But this is scarcely sufficient; the Aircraft Industry might be relieved of all liability for Excess Profits Duty, to the advantage of the country at large as well as to its own particular advantage.

Spoon Feeding Is Helpful.

Its peculiar position warrants such a demand. It was given birth primarily for the benefit of the nation with the object of clinching the war. Naturally enough, it was spoon-fed to a certain extent, and received tender financial nursing; the benefits have not all been to the State, it must be confessed, for there was a lot of profit made by the public.

Yet before it has really reached adolescence it is forced to struggle for existence and attain permanency like some poor orphan; and at the same time there is still a liability for Excess Profits Duty. Candidly one cannot by any stretch of the imagination believe that the State will receive much, if anything at all, in the way of Excess Profits Duty from aircraft. The State, which was the principal customer, has whittled down its orders to next to nothing.

Peace Profits and War Capitalisation.

It is farcical in the circumstances for the Aircraft Industry to have the preferential datum line in respect of excess profit liability. But this brings out the point that on the war-time-created capitalisation peace profits must necessarily be attenuated, comparatively speaking. At least they promise to be so until the transition period is passed; then one will be able to judge better the real position and divine the relation between war-time capitalisation and the profit-earning capacity of peace-time.

The Growing Nervousness of Investors.

Many investors who sank money into aviation ventures are fidgetting about the future; this nervousness is natural enough; with the drastic reduction in Government orders, they fear that, unless commercial aviation develops by leaps and bounds, their capital is in jeopardy. Perhaps they are unduly nervous.

Some Measures of Relief.

Assuming that there should prove to be a liability for the Excess Profits Duty, surely in the exceptional circumstances it would be unjust for the State to enforce its claim. On the contrary, it would not be unreasonable to ask the State, which did so much towards the upbuilding of the Industry, to devise some measures of relief, if not actual pecuniary assistance, calculated to stimulate initiative and foster development. A few more years of spoon-feeding on sound lines would be productive of much benefit, and the expense would not be considerable.

The Policy of the U.S. Government.

It is the transition period that will really test the Industry. In this connection one is entitled to refer to the policy adopted by the United States Government. To prevent a collapse of the aircraft manufacturing industry built up during the war, the war department proposes to be very liberal in its treatment of the companies, especially in regard to the placing of new orders.

This statement may be a rather generous interpretation of what is actually intended by the authorities, but evidently it is proposed to give such a measure of support that will enable the industry to carry on through the period of reorganisation, reconstruction and adaptation to changed conditions.

A Good Example.

If the United States intends to foster their industry by artificial means, there is a just claim for similar treatment by our own Government; indeed, our claim is more pressing because the Industry in this country has advanced further, and gives promise of attaining perfection quicker.

A Necessary Warning.

In conclusion one feels that it is imperative for the Industry to be on its best behaviour. Certain sections of the Press are criticising some embryonic scheme of a grandiose character, now apparently being hatched in a financial incubator.

Reasonable development schemes on sound and practicable lines are needful; they must be encouraged as much as possible. It is different with highfalutin' projects; too optimistic in conception and beyond the physical capacity of aviation, these deserve to be snubbed as much as possible. They may cause incalculable mischief.

W. J. Davies.

CURRENT TOPICS.

The Sunbeam's Success.

While aircraft shares themselves have been rather slack and uninteresting, there has been quite a lot of activity in some of the semi-aircraft descriptions at rising prices. The Sunbeam Motor Company, by the way, prepared an issue of £350,000 in the form of 5 per cent. tax-free Debenture stock, which, being offered at par, proved an immediate success.

What the Stock Exchange Expects.

This, incidentally, is one of many new capital issues on the tapis. There are literally hundreds to come. Industry throughout the country is ripe for amazing developments, in the opinion of competent observers, and, provided the labour position is not unduly disturbing, great things are expected. This is reflected in the Stock Exchange, where many industrial securities are booming. The buoyancy of oil shares is maintained too, and though it is not logical to expect a trade boom simultaneously with a liveliness in the House, some people expect the paradox.

The British Gold Shell Ring Company.

A meeting of the creditors was held last week, when the liquidator reported that the company was incorporated on March 31st, 1913, for the purpose of manufacturing gold shell jewellery such as was produced in the United States. The capital was £4,000, of which £2,000 was issued and paid up. Debentures were issued in 1914, for £2,886, and were subsequently increased by a further £2,000, but later the debentures were reduced to £880, and this amount was at present outstanding.

Later on the company ceased doing the business for which it was originally formed, and went into the aircraft business, applying itself to the manufacture of steel shackles. When the Armistice was announced, however, the business of the company was naturally affected, and the goods produced could not be disposed of.

There was at present a claim of over £10,000 against the Government. The assets amounted to £21,573, and on paper this showed a surplus of £3,318. The claims of the unsecured creditors amounted to £11,868.

A resolution was passed in favour of the appointment of Mr. A. G. Westacott, of Fenchurch Street, as co-liquidator with Mr. Hichens, and a committee of inspection was also appointed.

A Dope Inventor's Affairs.

At an adjourned sitting for investigating the affairs of Walter James Stevenson, Charing Cross Hotel, Strand, W.C., the statement of affairs disclosed liabilities £1,496 and assets upon which no realisable value was placed. The debtor is the inventor of an acetate cellulose. The examination had stood adjourned to enable the creditors to vote upon a proposal which had been lodged by the debtor for the payment of a composition of 10s. in the £ to all unsecured creditors. In his report upon that proposal the Official Receiver had stated that the only asset was a patent, the value of which the debtor treated as unascertained. At present the Official Receiver had no independent information as to whether the invention was realisable. If, however, it proved on investigation to be of little or no value, the terms of the debtor's proposal providing for a cash payment appeared to present advantages over an administration of the estate in bankruptcy. At the meeting of creditors convened to consider that proposal, a resolution was passed accepting it, and in due course it will come before the Court for approval. The Official Receiver now stated that the creditors, having entertained the debtor's proposal, he did not wish to put any further questions to him, and the Registrar therepon ordered the examination to be concluded.

Vickers' Latest Acquisition.

Vickers have taken preliminary steps to secure a controlling interest in W. T. Glover and Co., insulated wire manufacturers, of Manchester, by an exchange of shares.

Armstrong's Forward Policy.

By the way, Armstrong, Whitworth and Co. are also fully alive to the possibilities of an aggressive peace programme. With a view to securing a proper proportion of commercial engineering to balance other engineering work, a subsidiary has been formed under the title of the Armstrong-Whitworth Development Co. This company, it is emphasised, has been formed for the particular object of keeping up with leading concerns for the purpose of reconstruction development. The company is intimately related now to the Siddeley Deasy Co.

More New Ventures.

There appears to be a fresh outburst of new company regulations concerned with aeronautics. The majority are small and evidently the object in some cases is simply to secure a name.

MORTGAGES, CHARGES AND SATISFACTIONS

Aero Mechanical Co., Ltd.—Mortgage on order from Aircraft Manufacturing Co., Ltd. Dated March 28th, 1919, supplemental to mortgage dated Nov. 1st, 1918. Holders: National Provincial Bank of England.

NEW COMPANIES.

Tubbs, Lewis and Co., Ltd.—Private company. Registered April 24th. Capital, £250,000 in £1 shares. To take over the business of manufacturers of elastic webs, cords and braids, pins, needles, buttons, ornaments, smallwares, fishing lines, health exercisers, grip dumbells, shock absorbers, aeroplane parts, etc., carried on at Abbey, Langford, Lew and Charfield Mills, Wotton-under-Edge, Glos., and at 29-30, Noble Street, and Charterhouse Buildings, E.C., as "Tubbs, Lewis and Co." First directors:—S. W. Tubbs, 9, Hanover Terrace, Regent's Park, N.W., L. Tubbs, 7, Kidderpore Gardens, Hampstead, N.W. Solicitor: W. T. A. Rayner, Moorgate Station Chambers, E.C.

Cambrian Aerial Transport, Ltd.—Private company. Registered April 28th. Capital £100 in £1 shares. To establish and maintain aircraft lines and services, etc. First directors:—T. W. David, Ely Rise, Cardiff, timber importer; D. M. Rees, Benton House, Whitchurch, wire rope manufacturer; F. L. Demery, The Rectory, Penarth, aircraft manager.

Capac Co., Ltd.—Private company. Registered May 7th. Capital £5,000 in £1 shares. Manufacturers of and dealers in airships, aeroplanes and aircraft of all kinds, motor-cars and vehicles of every description, and to enter into an agreement with G. Richards. The subscribers (each with one share) are:—F. Snelling, 89, Dovercourt Road, Dulwich, S.E.22, law clerk; B. H. Gower, 136, Colney Hatch Lane, Muswell Hill, N.10, solicitor's managing clerk. Governing director: G. Richards, The Grange, Heronsgate, Ricksmanworth. Registered office: 2, Woodstock Street, Hanover Square, W.

RECEIVERSHIPS (APPOINTMENT OF RELEASE).

Highgate Aircraft Co., Ltd.—A notice of the appointment of S.E. Nixon, of Pauntley Street, Archway Road, N., as receiver and manager on April 2nd, 1919, under powers contained in debentures dated 1916-1918.

THE FIRST REAL BUSINESS FLIGHT.

Boulton and Paul, of Norwich, have a 100-year-old business as contractors and engineers, and in this branch of their business they have already been making use of their aeroplanes.

The first business trip was made before noon on May 1st. A Bury St. Edmund's firm was negotiating an important contract for the extension of their premises which involved a large constructional engineering order and wished to consult a representative of Boulton and Paul on the business. The Sales Manager the firm was anxious to send had his time closely filled with numerous appointments and business, and although the journey from Norwich is a short one it would have consumed the greater part of a business day to go to and fro and carry out the required discussion. A Boulton and Paul "P.6" two-seater machine was called into service, the Sales Manager was emarked, and in 20 minutes was landed at Bury St. Edmund's. The trip resulted in the firm securing a satisfactory contract.

The machine used is one which Boulton and Paul have adopted as the cheapest and most convenient for just such business trips as the one instanced. It is fitted with a 90 h.p. "R.A.F." engine, has a speed of over 100 miles per hour, carries fuel for a 300-mile flight, and can be sold at £600.

ANOTHER STRIKE.

A strike has broken out among the woodworkers at several of the London Aircraft factories, the Aircraft Manufacturing Company, Hendon, and the Handley Page works being at present those chiefly involved. It is stated that the strike is the outcome of a decision reached at a joint conference of woodworkers some time ago that notice should be given in May terminating the system of payment by results, which was strongly encouraged during the war by the Ministry of Munitions.

The Union principally concerned is the Amalgamated Society of Carpenters, Cabinetmakers, and Joiners, which has protested throughout against a continuation of the system, although some of its branches, containing an exceptional number of skilled men, have shown no desire to return to the system of current price rates.

Among the majority of woodworkers there is a keen desire, now that normal commercial activities are being developed, that time rates generally should take the place of all bonus systems, and the present discontent is an endeavour to obtain recognition of a principle which will have to be faced and accepted if good relationships are to be established in the industry.

FOR CHARITY'S SAKE.

The Women's Auxiliary Force are holding an All-Star Matinee at the St. James's Theatre on Friday, May 23rd, at 2.30 p.m., under the gracious support and patronage of H.M. Queen Alexandra in aid of the Women's Auxiliary Force Home Clubs for the Royal Air Force and other Service men.

The following well-known artistes have kindly consented to appear:—Miss Mary Moore, Miss Lilian Braithwaite, Mr. Dawson Milward, Mme. Mackenzie Fairfax, Mr. Mark Hambourg, Miss Eva Moore, Miss Violet Lorraine, Mr. Charles Coburn and Miss Amy Sherwin's "All-Nations Song-Pictures."

Tickets from 2s. to £1 1s. may be obtained from Box Office, St. James's Theatre; Women's Auxiliary Force, 172, Buckingham Palace Road, S.W.1, and the usual agents.

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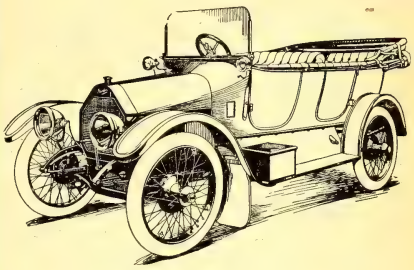
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NAVAL & MILITARY AERONAUTICS

FROM THE "LONDON GAZETTE."

ADMIRALTY, April 26th.

R.M.L.I.—Maj. T. O. H. Lees, A.F.C., returns to Corps duty from Secd. List (R.A.F.), and is borne supy. to estbt., April 7th.

Maj. T. O. H. Lees, A.F.C., is placed on the Retd. List at his own request, under the provs. of Order in Council of Nov. 29th, 1881, April 25th.

R.M. FORCES.—Maj. T. O. H. Lees, A.F.C., is appointed to the Res. of Officers, R.M., April 25th.

WAR OFFICE, May 6th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C., Mil. Wing.—The following appointments are made:—Flight Commdr.—Temp. Lt. W. D. Patrick (Gen. List), from a Flying Officer, and to be temp. Capt. whilst so empld., Jan. 4th, 1918. Equipment Officer, 3rd Cl.—Lt. W. E. Jones (Spec. Res.), March 31st, 1919.

ROYAL REGIMENT OF ARTILLERY.—R.G.A.—Maj. J. A. E. Edwards (Lt.-Col., R.A.F.) retires on ret. pay, May 7th.

AIR MINISTRY, May 6th.

R.A.F.—The following temp. appointment is made:—Area Commdr.—Col. (actg. Maj.-Gen.) A. V. Vyvyan, C.B., D.S.O., relinquishes the actg. rank of Maj.-Gen. and to be actg. Brig.-Gen. while so empld., April 26th.

FLYING BRANCH.—Capts. to be graded for purposes of pay and allowances as Capts. (A/ship.):—H. T. Jones, July 2nd, 1918; A. S. Elliott, D.S.C., from Aug. 14th, 1918, to March 15th; H. C. Irwin, to Jan. 31st; G. F. Meager, A.F.C., Nov. 8th, 1918; L. Whitworth, A.F.C., from Nov. 15th, 1918, to March 18th; H. A. H. Lectham, Nov. 25th, 1918; G. S. Greenland, Nov. 26th, 1918; S. E. Taylor, D.S.C., Dec. 6th, 1918.

Sec. Lts. to be Lts.:—A. A. Malcolm, L. B. Stewart, April 2nd, 1918; C. P. Sisley, May 13th, 1918; E. C. Richards, Dec. 27th, 1918; P. W. Watson, Feb. 1st.

Sec. Lt. J. S. Harrison to be actg. Lt. while empld. as Lt., from Sept. 26th, 1918, to April 30th.

Lt. S. Fremlin (Lt., I.A.R.O.) relinquishes his commn. on reverting to the I.A.R.O., March 21st.

The following relinquish their commns. on ceasing to be empld.:—Lt. R. M. Grant (Lt., Canadians), Jan. 9th; Lt. T. B. M. Brown (Lt., R.F.A.), Jan. 10th; Lt. W. A. Watson (Lt., Alb. R.), Feb. 11th; Sec. Lt. (Hon. Lt.) R. B. Francis (Lt., Can. M.G.C.), Lt. J. R. Law (Capt., Can. A.S.C.), Feb. 17th; Lt. W. K. Whittle (W. Yorks R.), Feb. 19th; Lt. J. A. Dickie (Lt., Manitoba R.), March 5th; Lt. H. W. Underhill (Lt., R.G.A.), March 11th; Lt. (Hon. Capt.) F. G. H. Manville, M.C., (Capt., Sask. R.), March 13th; Lt. G. A. Mercer (Lt., Can. Cyclist C.), March 21st; Sec. Lt. (Hon. Lt.) H. F. Hicks (Lt., Nova Scotia R.), March 27th; Lt. D. J. Stewart (Lt., York and Lancs. R.), April 9th; Lt. (Hon. Capt.) S. A. Flavelle (Capt., E. Ont. R.), April 14th.

Transferred to unemptd. list:—Lt. (actg. Capt.) D. Sutherland, Jan. 14th; Lt. B. Stevenson, Jan. 22nd; Capt. C. G. Sturt, A.F.C., Jan. 26th; Lt. J. R. Spyaul, Jan. 28th; Capt. W. A. Scott, D.S.C., D.F.C., Feb. 4th; Lt. (actg. Capt.) E. Swale, D.F.C., Feb. 5th; Lt. C. S. Scobie, Lt. A. A. Sevastopulo, Feb. 8th; Sec. Lt. T. Madoc-Jones, Feb. 10th; Sec. Lt. C. V. Lax, Feb. 11th; Capt. A. Lindley, Feb. 15th; Sec. Lt. H. M. D. Speagell, Feb. 18th; Lt. (actg. Capt.) M. G. W. Stewart, D.F.C., Feb. 19th; Sec. Lt. T. D. Sterland, Feb. 22nd; Sec. Lt. D. E. Gray, Feb. 23rd (substituted for notification in "Gazette," Feb. 18th); Lt. V. Smith, Sec. Lt. L. Sharp, Feb. 24th; Lt. B. C. Selfe, Feb. 27th; Sec. Lt. W. Souter, March 1st; Lt. H. T. Matthews, Capt. N. B. Smith, M.C., March 11th; Sec. Lt. V. H. Mather, March 13th; Lt. D. M. Allan, March 15th; Sec. Lt. B. Tamyiaritz, March 18th; Lt. F. V. Chapman, March 23rd; Lt. (actg. Capt.) A. H. Curtis, March 25th; Sec. Lt. (Hon. Lt.) H. Terrell, March 27th; Sec. Lt. F. Chambers, Lt. R. B. M. Jenkins (R.F.A., T.F.), March 28th; Sec. Lt. W. G. A. Bird, March 31st; Sec. Lt. S. H. Bazeley, Lt. G. W. Hales, Lt. M. M. Kaizur, Sec. Lt. F. Stringer, April 2nd; Maj. J. A. Crook, Sec. Lt. W. A. C. Haines, Sec. Lt. (Hon. Lt.) B. Jacobs, M.C. (E. Kent R.), Lt. H. B. Milling, Sec. Lt. T. Searle, April 3rd; Lt. B. S. Cole, Lt. (actg. Capt.) S. C. Joseph, D.F.C., Lt. H. A. Johnston, Lt. C. L. Stubbs, April 4th; Sec. Lt. T. F. Thorogood, Sec. Lt. L. G. Tcarle, April 5th; Lt. (actg. Capt.) G. J. H. Lascelles, Lt. K. A. W. Leighton, Capt. B. B. Toms, April 6th; Lt. B. S. B. Baylis (York and Lancs. R.), April 7th; Lt. C. G. Bushe, Lt. C. P. Donnison, Sec. Lt. E. S. Ellery, Lt. (Hon. Capt.) T. E. Lander (High L. Inf.), Capt. G. Smethurst, Lt. H. H. Storey (R.E., T.F.), April 8th; Sec. Lt. A. A. Betterley, Lt. W. Briggs, Lt. E. W. Hutchings, Sec. Lt. L. Kehoe, Lt. F. B. B. Shand, Sec. Lt. E. G. F. Salmon, Sec. Lt. N. F. Swan, Lt. P. F. Turner, Sec. Lt. J. F. L. Wood, April 9th; Lt. C. J. F. Lester, Sec. Lt. J. R. Traves, April 10th; Sec. Lt. J. G. Caygill, Lt. H. F. Chapman, Sec. Lt. (Hon. Capt.) S. T. Goodman, M.C., D.C.M., Sec. Lt. G. C. Lacey, Sec. Lt. (Hon. Lt.) T. Sandilands, Lt. F. A. Smith, A.F.C., Lt. G. T. Thorman, Sec. Lt. (Hon. Lt.) E. G. Tyler, April 11th; Sec. Lt. C. H. Askwith, Lt. R. Collopy, Sec. Lt. (Hon. Lt.) E. W. Collis, Sec. Lt. L. G. Catkrall, Lt. T. A. Doran, Lt. K. Don, Sec. Lt. W. Grayson, Capt. (actg. Maj.) T. Hinshelwood, D.S.C., D.F.C.; Lt. (actg. Capt.) E. R. Heath (Welsh R.), Sec. Lt. (Hon. Lt.) A. P. Hitchens (R.E.), Sec. Lt. W. B. Warneford, April 12th; Lt. B. C. L. Barton, Lt. (actg. Capt.) G. W. Bulmer, M.C., Sec. Lt. C. Burnett, Sec. Lt. D. F. Brooks, Sec. Lt. F. O. Boyill, Lt. R. T. A. Cupiss, Sec. Lt. J. M. Caldwell, Sec. Lt. A. T. Cross, Sec. Lt. E. B. Driver, Sec. Lt. (Hon. Lt.) C. B. Hayes, M.C., Sec. Lt. W. H. Irvine, Sec. Lt. H. Proudlove, Sec. Lt. H. J. Randall, Sec. Lt. W. Roberts, Sec. Lt. C. J. Rogers, Sec. Lt. K. S. Rankin, Sec. Lt. W. E. Surman, Sec. Lt. R. E. Standfield, Sec. Lt. J. S. Selak, Sec. Lt. W. H. Taylor, Capt. R. M. H. Young, Lt. T. J. Young, April 13th; Lt. J. A. Beesley, Sec. Lt. G. W. Bagsley, Capt. H. S. Bompas, Sec. Lt. C. H. Berry, Lt. P. R. Crowe, Sec. Lt. T. D. Goord, Sec. Lt. L. W. Pooley, Sec. Lt. L. W. S. Smith, Sec. Lt. (Hon. Lt.) R. R. Thompson, Lt. D. G. Williams, Capt. F. R. Walker, April 14th; Sec. Lt. H. E. Anderson, Lt. (actg. Capt.) F. Belway, D.F.C., Lt. W. N. Breingan, Sec. Lt. A. Callender, Sec. Lt. F. Coates, Lt. W. R. Coventry, Sec. Lt. W. G. Cairns, Lt. H. S. Chapman, Sec. Lt. H. Clarke, Sec. Lt. J. Crawford, Sec. Lt. R. D. Connor, Sec. Lt. S. A. Cluning, Capt. G. H. Hackwill, M.C., Sec. Lt. R. W. Hill, Lt. W. B. Kellogg, Capt. J. L. Kerry, D.S.C., Sec. Lt. S. R. Robertson, Sec. Lt. G. Scott, Lt. H. T. Thompson (R.F.A.), Lt. D. J. Wiston, April 15th; Sec. Lt. J. C. Bishop, Sec. Lt. W. E. Blake, Lt. D. S. Cramb, Sec. Lt. R. C. Cary, Lt. M. Faure, Sec. Lt. S. Engel, Lt. D. T. W. Gray, Sec. Lt. (Hon. Lt.) S. T. Jerome, M.C., Sec. Lt. J. G. Kershaw, Capt. E. A. Mossop, Sec. Lt. E. A. Radcliffe (L'pool R.), Sec. Lt. G. A. Sheeley, April 16th; Lt. W. H. Askew, Capt. E. L. B. Buchanan, Capt. R. E. Bryson, M.C., Sec. Lt. B. L. Clift, Sec. Lt. H. Crossley, Capt. (actg. Maj.) W. J. Calderwood, Lt. (actg. Capt.) L. P. Coombes, D.F.C., Sec. Lt. W. C. Hart, Lt. R. Neish, Sec. Lt. I. N. Rees, Sec. Lt. C. E. Standish, Lt. L. A. Sterling, M.C. (R.F.A.), Capt. G. C. Walker, April 17th; Lt. R. H. Barratt, Lt. (actg. Capt.) D. C. M. Brooks, Capt. P. C. Campbell, M.C. (Arg. and Suth'd Highrs.), Lt. C. S. Hallinghurst, M.C., Lt. H. R. Hastings, Sec. Lt. F. H. Langmaid, Capt. R. J. M. de St. Leger, Sec. Lt. G. R. Robinson, Lt. C. H. Weir (Royal Scots), Lt. W. A. Wheeler, Sec. Lt. J. H. W. Wilcox, April 18th; Lt. H. K. Caffyn, Sec. Lt. H. Connell, Lt. T. F. N. Stack, April 19th, Sec. Lt. T. Alfred, Lt. F. F. H. Bryan, Sec. Lt. J. J. Comerfield, Sec. Lt. E. H. Duffy, Sec. Lt. M. M. Dearman, Sec. Lt. A. E. Huffer, Sec. Lt. D. B. Hughes, Sec. Lt. H. G. H. Lowe, April 20th; Sec. Lt. R. Begg, Sec. Lt. E. A. Bowyer, Sec. Lt. B. R. A. H. Davies, Sec. Lt. T. T. Hazelwood, Sec. Lt. G. N. G. Hamilton, Lt. H. R. Sewell, Sec. Lt. J. Nightingale, Sec. Lt. H. T. Taylor, Sec. Lt. A. F. F. Weingott, April 21st; Sec. Lt. L. J. Appleby, Sec. Lt. (Hon. Lt.) R. W. Glassborow, Sec. Lt. S. T. Marshall, Sec. Lt. R. H. Walker, Sec. Lt. S. J. Winis, April 22nd; Sec. Lt. W. R. Ayling, Capt. (actg. Maj.) J. A. Coats, A.F.C., Sec. Lt. F. E. Collins, Lt. F. M. Wilhams, April 23rd; Sec. Lt. W. T. Annan, Lt. D. S. Atkinson, Lt. G. A. Bateson, Sec. Lt. L. G. Brown, Sec. Lt. B. A. Bird, Sec. Lt. A. R. Bartlett, Lt. A. E. Bruce, Sec. Lt. V. F. Bendrodt, Lt. L. W. Boland, Sec. Lt. J. W. Barus, Sec. Lt. A. E. Buckingham, Sec. Lt. J. G. Clayton, Sec. Lt. W. T. Carew, Sec. Lt. M. J. Carroll, Sec. Lt. E. O. Champagne, Sec. Lt. C. A. Chisholm, Sec. Lt. S. A. Church, Sec. Lt. G. D. Churchward, Sec. Lt. H. Church, Sec. Lt. E. W. C. Cox, April 24th; Lt. G. Allsop, Sec. Lt. (actg. Maj.) W. C. Bersey, Lt. (actg. Capt.) J. E. Burgess, Sec. Lt. B. D. Bolas, Sec. Lt. R. A. Button, Sec. Lt. H. C. Collis, April 25th; Sec. Lt. F. F. Bates, Lt. R. E. Butler, April 26th; Sec. Lt. (Hon. Lt.) S. H. Hodges (Lanc. Fus.), Sec. Lt. G. E. D. Low, Sec. Lt. G. Tattersall, Sec. Lt. A. C. Taylor, Sec. Lt. Turkington, Sec. Lt. (Hon. Lt.) W. R. Trounce, April 29th; Capt. A. M. Van der Byl, May 1st; Lt. K. Norwood (N. Lancs. R.), May 4th; Lt. C. A. Mason, May 5th.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—F. H. Johnson, March 22nd; J. D. M. Miller (contracted on active service), April 22nd (substituted for notification in "Gazette," Jan. 7th).

Lt. A. F. Platt is dismissed the Service, his Majesty having no further occasion for his services as an officer, April 7th.

Sec. Lt. W. T. Morrison resigns his commn., May 7th.

The initials of Lt. E. W. O. Hall are as now described, and not E. O. W. as stated in "Gazette," March 7th.

The initials of Lt. A. L. Moneer are as now described, and not N. L. as stated in "Gazette," April 13th.

The notification in "Gazette," Dec. 31st, 1918, concerning Sec. Lt. E. Dunville is cancelled.

The notification in "Gazette," Dec. 13th, 1918, concerning Sec. Lt. E. H. Searle is cancelled.

The notification in "Gazette," April 18th, concerning Lt. J. Davidson is cancelled.

The notification in "Gazette," March 21st, concerning Sec. Lt. F. Johnson is cancelled.

The notification in "Gazette," March 28th, concerning Lt. H. J. Collar is cancelled.

The notification in "Gazette," Feb. 14th, concerning Lt. S. R. Mantle is cancelled.

The notification in "Gazette," April 1st, concerning Sec. Lt. S. E. King is cancelled.

The notification in "Gazette," April 1st, concerning Sec. Lt. (Hon. Lt.) D. Millar is cancelled.

Apprentices to Aeronautics.—To be Majs. and relinquish the grading for purposes of pay as (S.O.):—Capt. (actg. Maj.) N. A. Daniell, Jan. 7th; Maj. W. J. King, M.C., Feb. 3rd; Capt. (Hon. Maj.) R. H. Howell to be Maj. from (S.O.), Nov. 18th, 1918.

Capt. (actg. Maj.) J. Selwyn to be Capt., and relinquishes the actg. rank of Maj. from (S.O.) from Oct. 26th, 1918, to Dec. 20th, 1918.

Lt. G. A. Miller to be actg. Capt. whilst empld. as Capt., from Aug. 8th, 1918, to April 10th.

C. B. Stead (Lt., R.H.A., T.F.) is granted a temp. commn. as Lt., Oct. 1st, 1918, and to be actg. Capt. whilst empld. as Capt. from Oct. 1st, 1918, to April 10th (substituted for notification in "Gazette," Feb. 14th).

Lts. (A.) to be Lts.:—W. U. Hughes, H. Macpherson, April 17th.

Lt. C. C. Dunfield to be Lt. from (T.), Oct. 2nd, 1918 (substituted for notification in "Gazette," April 4th).

Sec. Lt. F. Sumpter to be Lt., April 2nd, 1918.

Sec. Lt. F. Mann to be Sec. Lt., from (A. and S.), April 17th.

Sec. Lt. C. H. Bartlett (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt., April 1st, 1918.

Lt. F. A. Perren (Sec. Lt., Hamp. R.) relinquishes his commn. on ceasing to be empld., Nov. 18th, 1918.

Transferred to unemptd. list:—Lt. E. A. Smirke, M.C., Jan. 24th; Sec. Lt. R. Sharrock, Jan. 26th; Lt. P. W. Sim, Jan. 29th; Lt. (actg. Capt.) C. A. Pelham, Feb. 1st; Sec. Lt. (Hon. Lt.) D. Millar, Feb. 6th; Sec. Lt. (Hon. Lt.) C. N. Leeston-Smith, Feb. 11th; Sec. Lt. W. C. E. Skelton, Feb. 13th; Sec. Lt. H. B. Stubbs, Feb. 16th; Lt. R. G. Taylor, Feb. 27th; Capt. (actg. Maj.) P. C. Sekeline, March 6th; Sec. Lt. J. T. C. Smith, March 11th; Sec. Lt. J. H. Roberts, March 13th; Lt. (actg. Capt.) W. C. Short, March 17th; Lt. (Hon. Capt.) R. S. McGregor-Shepherd, March 21st; Sec. Lt. (actg. Lt.) H. S. Counsell, Sec. Lt. E. Smith, April 1st; Capt. R. C. Campbell (Somerset L.I., T.F.), April 2nd; Sec. Lt. E. R. F. Cole, Capt. J. A. Shepherd, April 3rd; Sec. Lt. J. G. Campbell, Lt. R. R. Gidney, April 4th; Sec. Lt. C. L. H. Johnson, Lt. (actg. Capt.) T. F. Legard, April 6th; Sec. Lt. W. C. Rankin, April 9th; Sec. Lt. A. D. Tomsett, Sec. Lt. J. C. Thomson, April 11th; Lt. (actg. Capt.) G. E. Gillett, Lt. P. S. L. Lee, Sec. Lt. L. R. Ravner, April 12th; L. D. M. K. Masendar, Sec. Lt. A. Midgley, Sec. Lt. G. D. Nokes, April 14th; Sec. Lt. F. C. Taylor, April 15th; Lt. A. B. Cox (Northants R.), Lt. M. A. Hancock, Sec. Lt. E. W. Liddiard, Sec. Lt. H. Taylor, April 15th; Lt. (actg. Capt.) W. H. Dean, Sec. Lt. A. W. Garnett, Lt. H. V. M. Hoskins, April 16th; Sec. Lt. C. Beard, Sec. Lt. (actg. Lt.) J. E. Dawes, Sec. Lt. H. B. Twissell, April 17th; Lt. P. M. Blackwood, Lt. A. L. Crow, Capt. W. N. Goldsmith, Sec. Lt. F. G.

Kitson, April 18th; Lt. A. C. Illingworth, April 19th; Lt. J. D. Davidson, April 20th; Lt. T. E. Blackater, Sec. Lt. H. Varney, April 21st; Lt. M. C. Mossop, A.F.C., April 22nd; Lt. K. M. Catdley, April 23rd; Lt. (actg. Capt.) H. K. Ballantine, Sec. Lt. J. J. Browne, Capt. W. R. Corfield, M.C., April 25th; Maj. (actg. Lt.-Col.) J. M. Boyd, Sec. Lt. R. O. Cook, Sec. Lt. C. Ham, May 1st.

Lt. H. H. Marks relinquishes his commn. on account of ill-health and is permitted to retain his rank, May 7th.

The following Sec. Lts. resign their commns. :—R. M. Ross, H. Worley, May 7th.

Sec. Lt. J. P. Smith is dismissed the Service, his Majesty having no further occasion for his services, March 6th.

The notification in "Gazette," April 8th, concerning Sec. Lt. V. T. Lloyd-Davis is cancelled.

The initials of W. J. Wreford are as now described and not as stated in "Gazette," March 18th.

The notification in "Gazette," Nov. 22nd, 1918, concerning Lt. (actg. Capt.) J. F. Byrom is cancelled.

TECHNICAL BRANCH.—Lt. (actg. Capt.) G. A. Heath relinquishes the actg. rank of Capt., Grade (B), on ceasing to be empld. as Capt., April 23rd.

Lt. W. Bourne to be graded for pay as Lt., Grade (B), March 20th.

Sec. Lt. R. R. Crosby to be Lt., with pay and allowances of that rank, Feb. 28th (substituted for notification in "Gazette," Feb. 28th).

Sec. Lts. to be Lts., without pay and allowances of that rank :—C. C. Duffield, April 2nd, 1918 (substituted for notification in "Gazette" March 7th); (Hon. Lt.) H. J. Gilbert, April 3rd, 1918; H. C. Baker, March 1st.

Maj. S. J. Lacey, O.B.E. (Lt.-Commdr., R.N.) relinquishes his commn. on ceasing to be empld., March 20th.

Transferred to unemptd. list :—Sec. Lt. T. H Sutherland, Jan. 15th; Sec. Lt. G. Williams, Jan. 25th; Lt. F. G. Seabrooke, Jan. 31st; Sec. Lt. M. B. Barrand, Feb. 3rd; Lt. (Hon. Capt.) R. P. Gosnell, Feb. 4th; Lt. G. Carr, Feb. 11th; Sec. Lt. (acte. Lt.) (actg. Capt.) R. L. Burdon-Sanderson, Feb. 21st; Capt. C. R. E. Pope, Feb. 25th, Lt. C. R. Skinner, March 1st; Capt. W. E. Smith, March 2nd; Capt. M. G. Millar, March 4th; Capt. A. H. Squire, March 11th; Lt. E. G. Thompson, March 24th, Lt. (actg. Capt.) W. L. Joseph, March 30th; Capt. G. H. Tilly, March 30th; Capt. (actg. Maj.) J. D. Drysdale, O.B.E., March 31st; Capt. G. T. R. Hill, M.C., April 1st; Lt. R. W. Langmaid, April 4th; Capt. C. Hayes, April 5th; Lt. N. Goodwin, April 7th; Lt. A. H. Cabeldu, Sec. Lt. F. E. Smyth, April 8th; Lt. V. F. J. Barker, Maj. L. W. F. Turner, April 9th; Sec. Lt. G. H. Lane, Lt. W. A. Todd, April 10th; Lt. S. H. Frye, Capt. T. M. Wilson, April 11th; Sec. Lt. R. J. Berry, Sec. Lt. W. F. Beirs, Sec. Lt. F. Batterbury, April 12th; Lt. J. L. Cuthbertson, Capt. A. S. Ince, D.S.C., April 13th; Sec. Lt. (acte. Capt.) G. B. Nicol, Sec. Lt. P. A. Wells, April 14th; Sec. Lt. A. J. Bull, Sec. Lt. W. G. T. Blois, Sec. Lt. C. W. Cornell, Sec. Lt. (actg. Lt.) A. F. Loveday, Sec. Lt. S. Pope, April 15th; Sec. Lt. G. Ackermann, Lt. H. B. Howe, Sec. Lt. F. Wood, April 16th; Lt. H. A. Moncrieff, April 17th; Sec. Lt. R. J. Rogers, April 18th; Sec. Lt. (Hon. Lt.) F. Baxter, Capt. C. D. Butler, Lt. J. H. Darrah, April 23rd; Lt. (actg. Capt.) W. H. Farnell, April 24th; Capt. E. E. Benest, April 27th; Lt. W. McTaylor, Lt.-Col. H. T. Tizard, A.F.C., April 29th.

Sec. Lt. (Hon. Lt.) A. Dobner relinquishes his commn. on account of ill-health, May 7th.

The date Lt. E. H. Pitchew relinquishes his commn. is July 28th, 1918, and not as stated in "Gazette," July 30th, 1918.

The christian names and surname of Sec. Lt. Andrew John Brown are as now described, and not as A. J. Brown, M.C., as stated in "Gazette," April 8th.

The notification in "Gazette," Sept. 17th, 1918, concerning Lt. B. B. Lemon is cancelled.

MEDICAL BRANCH.—Transferred to unemptd. list :—Lt. L. E. Stamm, Feb. 21st; Capt. J. B. Stevenson, Feb. 25th; Maj. A. H. Hogarth, April 23rd.

Maj. A. Paling relinquishes his commn. on account of ill-health, May 5th.

CHAPLAINS BRANCH.—Asst. Principal Chapln. for Wesleyans.—Rev. A. S. Bishop (Chapln., 4th Class, A.C.D.) is granted a temp. commn. as Chapln. with relative rank of Capt., and is granted the relative rank of Maj., whilst empld. as Asst. Principal Chapln., Jan. 1st.

Transferred to unemptd. list :—Col. the Rev. W. J. Selby, M.A., April 4th; Capt. J. H. Bentley, April 12th.

MERCHANTMEN.—The following Merseas Cadets are granted temp. commns. as Sec. Lts. :—7661 W. Lyall, 18226 L. G. Livingstone, 18429 H. J. Linder, 181846 Z. A. W. Lewis, 177631 J. B. Long, 926 E. C. Lyttle, 182235 M. D. Miller, 182294 C. V. Merriman, 184269 E. R. Miller, 183865 R. V. Mansfield, 182702 H. W. Marchant, 182215 B. L. Melville, 182887 J. L. Munro, 182309 E. H. Moses, 182264 O. F. Melville, 182565 A. W. Marshall, 182115 R. G. Murray, 182292 A. S. Manchip, 184538 C. B. Miles, 184535 C. V. Marshall, 182091 F. L. Morris, 183864 J. W. McCaskill, 184271 D. J. Muir, 183128 W. C. Mitchell, 184531 H. C. McCallum, 181864 C. S. Milne, 181873 A. S. Milne, 184537 F. Martin, 184540 G. Muller, 184267 J. McInnich, 172214 F. A. Mackay, 180378 P. F. Moffatt, 182267 A. H. Maish, 176684 H. Miller, 184210 W. Matthews, 182111 R. Mathieson, 182291 A. E. Manchip, 184270 A. Morris, 182144 A. Michelsohn, 137812 H. McLeod, 182216 C. Meth, 182266 D. S. Mannion, 184541 R. Musson, 182293 A. Martin, 183886 A. McDonald, 176577 L. McGennis, 193364 J. W. R. Miller, 184580 C. Mortimer, 184268 D. H. McIlet, 176724 S. B. Mayer, 182295 W. Mills, 3208 J. F. Mabberley, 182251 C. H. MacClan, 182276 C. McInich, 182214 F. A. Mackay, 180378 P. F. Moffat, 182267 A. H. Maish, 7539 J. H. Mitchell, 11654 R. M. McLaren, 184539 J. C. Moore, 1276 W. McLaughlin, 182116 A. Nathan, 182164 V. V. Nel, 183341 T. Le G. Nel, 184542 B. T. C. Norton, 184543 L. A. Norenius, 183342 F. R. Nel, 182193 J. H. Nel, 183867 C. H. J. Nel, 182194 S. H. Oeriel, 184544 C. Oberhauser, 182195 F. O'Donovon, 182530 D. Oldman-Brownlee, 180722 F. W. F. Purcell, 1165 W. W. Paterson, 180803 E. V. Pett, 184222 M. Poplak, 181856 W. Peacock, 182117 L. Perry, 182107 J. C. Prior, 182095 W. J. Pullock, 182218 W. J. Paul, 182003 W. Pickins, 183253 H. R. Pearce, 183287 H. E. Poyall, 182002 J. Palmer, 183888 D. Parkin, 182296 A. Pulvité, 182218 C. S. Potgieter, 182236 H. M. Patrick, 182177 A. D. Pickering, 182268 C. A. Packman, 182269 J. K. Packman, 183889 A. J. Ponton, 1501 S. A. Page, 6503 E. Parkinson, 182252 A. J. O. Peters, 176517 J. Quibb, 176606 T. C. Robertson, 176690 G. T. Richards, 182103 E. Russell, 182007 S. Roseburg, 182295 C. M. Riley, 182165 J. D. Rousseauw, 183807 L. J. Rogers, 184548 O. W. Ryley, 184280 A. G. Randall, 182096 W. J. Randall, 182200 C. G. Rickett, 182116 D. J. Rocher, 182167 C. G. Rocher, 316611 W. H. Rethman, 183803 L. R. Ratenbach, 182201 W. J. Roberts, 182179 P. E. Rosebrook, 182109 A. A. Rynhoud, 182237 P. L. Ruiter, 183607 R. H. Ross, 184274 G. Richter, 184733 G. M. Robertson, 7666 S. G. Roberts, 182210 P. B. P. Randall, 182 R. H. Rogers, 89454 R. M. Shimmin, 137952 R. H. Stevens, 184549 L. L. Sawyer, 182181 A. P. E. Sinclair, 178200 I. Simon, 182121 A. Smith, 184554 G. C. Southgate, 184553 H. B. Stroebel, 182102 S. Smith, 183897 T. Shepherd, 182009 L. Seligsohn, 182221 A. Sparks, 184283 G. D. Scott, 182202 H. B. Steyne, 182271 W. H. Smithers, 182120 H. W. Stevenson, 184808 E. E. Stuart, 182804 E. Stewart, 178212 J. D. Struthers, 182533 S. L. Smith, 182122 V. C. Schofield, 184976 W. M. Spurgeon, 182101 H. K. Smith, 182534 R. P. Stevtler, 183895 G. C. Stafford, 182238 F. C. Strobel, 12447 L. G. L. Salew, 184815 P. J. Schravensande, 184240 S. W. Smith, 326 G. R. Smuts, 183872 A. J. Stone, 176612 J. F. Sandeman, 137946 A. C. Sheppard, 182180 A. S. Sheriffs, 182100 C. P. Smith, 178213 M. S. Stryne, 80 B. H. Schmidt, 192 H. D. W. Smith, 184275 J. B. M. Tannahill, 183901 D. W. H. Thorold, 184558 C. E. Taylor, 184276 O. Tarr, 182182 K. Truman, 184277 B. E. Tuck, 183905 O. Tucker, 316816 L. J. Tucker, 180545 E. C. Thompson, 184557 A. B. Tod, 183907 B. W. G. Tutton, 183902 O. E. S. Tutton, 184555 A. R. Templeton, 182123 R. E. Thorp, 183900 P. Toens, 317662 A. G. Tugg, 320 C. L. J. Truran, 182277 C. S. Van Ryneveld, 184559 H. Van Graan, 182136 J. A. Van Niekerk, 152224 H. S. Venter, 182203 A. K. Van Niekerk, 180677 W. K. Van der Spuy, 10383 N. A. Van Vurren, 182168 P. Vallentine, 182185 F. Van Breda, 182257 C. P. Vice, 117691 A. R. Veysie, 179225 A. J. Vanne, 182280 G. Whittaker, 184278 G. S. Way, 182169 R. W. Walker, 184560 T. R. Walters, 184562 E. Woolmore, 183907 H. D. Wood, 182258 R. C. Wilson, 184561 C. H. Wright, 192183 J. B. Wood, 182225 T. C. Wood, 184279 S. Whittaker, 184280 G. Whittaker, 180000 J. F. Wege, 184281 J. W. Wiggill, 183358 L. W. Widdicombe, 10972 R. Wakeford, 4805 R. H. Wainwright, 111144 J. D. Wolfe, 182204 H. H. Wood, 176619 D. Wood, 131 R. T. Wimmer, 11535 F. H. G. Waller, 182184 C. Yeats, 182137 B. Yankleson, 183908 R. A. Young, 182106 D. M. Young, 182297 S. R. Young, 177907 E. L. Youngleson, 117613 D. Ashworth, 177685 W. H. Bushe, 153683 G. G. Brown, 184565 E. C. Curtiss, 178620 L. de Silva, 177776 R. Devertilli, 175183 J. W. Gay, 174480 A. H. Peake, 161679 H. J. Hall, 276196 J. D. Haddock, 100337 W. F. MacCunn, 117811 E. S. O'Connor, 316527 E. T. Fellnet, 180848 A. B. Perkins, 182332 S. F. Rodriguez, 117599 W. Stuart, 110125 E. D. Shepherd, 181325 A. M. Thomson, 182419 D. Weatherstone, 173518 R. E. Wilder, 154937 A. M. Watt, 316113 J. P. Young, 128347 J. Carmichael, 137906 A. W. C. Daly, 137907 C. W. A. Doherty, 3637 A. P. Dutoit 175163 C. J. Dutoit, 176866 H. M. S. Edwards, 7637 E. W. Eyles, 176538 E. B. A. Gilson, 740 J. W. Goff, 178182 I. Kaliski, 178900 W. A. Lawrenson, 170681 H. G. Lovell, 176564 E. R. Mowat, 137918 G. Olive, 176602 N. G. H. Raw, 178317 H. Rothstein, 182178 W. H. Robinson, 178211 W. Simpson, 177577 J. Thring, 177130 D. Checkley, 182266 O. M. Overdale, 170487 W. P. Coles, 179142 W. D. Dunlop, 179144 A. Fyfe, 179146 D. T. Goodson, 179136 C. M. Gordon, 179152 F. Hazlett, 170490 I. H. M. Keith, 179092 H. W. MacFarlane, 179478 J. W. McKendry, 179158 D. MacKay, 179091 K. A. MacKenzie, 179173 L. A. S. Sheriff, 179373 R. G. Sinclair, 179172 G. A. Smith, 178718 J. Webster, 179467 I. H. Wilson, 179151 B. Moncrieff, 179180 J. B. Wilson, 179167 B. I. Orr, 316346 D. C. Abbott, 172130 H. A. Aylen, 172280 R. E. Alexander, 116347 A. Anderson 178765 G. Adams, 154590 G. W. Ashley, 171279 J. Aird, 171784 H. Ainsworth, 153098 F. R. Appleton, 172684 H. J. Archibald, 316322 E. C. Arbouast, 172239 P. W. Ainger, 172626 F. W. Anderson, 316597 H. S. Bell, 172312 D. Anderson, 172039 W. Blackman, 519336 E. E. Brown, 784206 R. Buell, 506449 H. Ball, 521153 A. L. Barker, 70712 J. Barlow, 316247 C. T. Browne, 172039 V. M. Burns, 171096 D. J. Berryhill, 1260429 H. H. Boyle, 154365 R. G. Brinsmead, 316006 J. E. Briggs, 427574 G. N. Brittin, 154214 P. A. Bessette, 1477 G. A. Broder, 171820 W. H. Bilais, 668584 E. T. Batchelor, 1477 G. C. Bessette, 316320 F. W. Burnip, 316961 W. J. Burgess, 171498 J. A. Barette, 171620 P. B. Burgwin, 181508 A. R. Beverley-Giddings, 171090 C. H. Boucher, 171111 S. Bentley, 171092 T. F. Barrett, 154743 J. V. Braga, 67328 T. G. Black, 176802 J. C. Brault, 154443 J. Butler, 170789 W. H. Booker, 172247 N. J. Betournay, 170764 E. L. Brim, 154675 G. H. Bradberry, 172068 E. E. Buckman, 525082 F. G. Boyes, 316107 H. C. Bridger, 42797 G. Bristow, 71008 D. Bergin, 154906 L. N. Benedict, 303458 A. E. Brown, 171917 W. E. Bothwell, 171845 W. J. Baxter, 172088 E. G. Bullinger, 154151 F. Butcher, 154224 D. M. Buell, 171904 P. M. Beale, 513390 T. Barrett, 171055 D. M. Bower, 316111 C. J. Bowers, 13580 A. Bullard, 171013 H. L. Chisholm, 154147 T. F. Connor, 540009 R. W. Cameron, 171985 W. J. Chinnick, 324917 G. A. Clark, 500280 P. Crook, 316269 A. C. Clarry, 14817 S. J. D. Clack, 171518 A. Crum, 183600 K. Campbell, 59153 W. Charles, 153981 J. R. Clarke, 316216 J. T. Chapman, 542484 A. Chapman, 316283 H. F. Cannon, 126137 G. M. Campbell, 316866 R. J. Carson, 316867 J. R. Cole, 59081 L. L. Connon, 172169 S. M. Cody, 523501 G. L. Christie, 172403 D. H. Clarke, 172405 J. F. Cole, 171849 L. H. Creber, 177401 W. E. Craig, 461536 H. N. S. Coombes, 154721 J. W. Carter, 172567 H. S. Charrette, 172022 J. W. Campbell, 83795 A. Chesser, 171581 C. S. Chapman, 171100 L. C. Cleveland, 172165 L. H. D. Clarke, 171453 F. A. Curran, 316124, 154840 M. Calder, 316870 W. Cockroft, 120083 C. A. Downman, 316350 W. M. Digby, 171517 R. A. Dundas, 177179 C. S. Davies, 03570 P. A. Dubrule, 172163 H. C. Davison, 316360 J. E. Durham, 154602 D. Doxsee, 767282 R. L. Denny, 316062 H. Dixon, 541913 L. Downiton, 126570 L. G. Day, 303447 L. A. Drew, 177388 J. V. O. Ducheschesneu, 171331 P. De Caillaux, 172238 R. Dunn, 171930 G. Evans, 171923 H. G. Elliott, 171872 E. W. Edwards, 171558 L. A. Ellis, 316362 W. H. Edwards, 181103 W. T. Eoff, 183601 J. H. Eaton, 11106 R. Edmiston, 154434 F. H. Emerson, 171872 T. P. Edworthy, 316326 A. L. Feron, 759 W. S. Farrell, 516161 D. R. Fick, 171162 E. Foisey, 171006 A. Fleming, 177470 R. B. Finch, 771454 A. Farquhar, 154770 G. H. Fry, 172002 W. O. Freeze, 541760 E. S. Fletcher, 171806 W. C. Fritz, 302971 W. Gray, 171161 J. K. Gordon, 50050 C. D. Glenister, 108246 W. M. Gordon, 316206 C. F. Gervan 177768 H. W. Gee, 170804 H. F. Gyles, 171584 B. B. Greene, 174795 C. F. Gillon, 316185 C. J. Greene, 706934 L. J. Gannon, 540393 A. Goldwell, 316185 H. H. Gregge, 172231 W. N. Graham, 406072 A. C. Gibbons, 171577 A. G. Glendinning, 171770 H. Gilker, 153622 R. W. Grant, 171512 T. E. Glancey, 157685 A. C. Gamer, 172802 P. H. Griffin, 70400 A. E. Griffiths, 316288 W. E. Gordon, 316310 G. Harris, 172157 W. Hume, 316071 H. A. Hetherington, 107296 C. E. Huntley, 142201 W. N. Hopper, 171848 J. B. Harrington, 50452 H. H. Herron, 316166 A. W. Hodson, 316023 F. Hanson, 172312 E. R. Henley, 316029 H. Halliwell, 11581 P. B. Harvard, 107210 E. H. Hawken, 2004233 W. B. M. Haldane, 171617 D. T. Hird, 751251 S. M. Hinshaw, Feb. 5th.

Temp. Hon. Lt. F. Read relinquishes his commn. on ceasing to be empld., March 16th.

The following are transferred to unemptd. list :—Lt. (actg. Capt.) P. H. Barr, from (S.O.), March 28th; Lt. (Hon. Capt.) (actg. Capt.) W. T. Taylor, from (S.O.), April 2nd; Capt. (actg. Maj.) F. H. Tyas, from (S.O.), April 14th; Capt. F. C. Hogarth, from (S.O.), April 15th; Lt. (actg. Capt.) L. S. Kiggell, from (S.O.), April 16th; Maj. J. Rubie, O.B.E., from (S.O.), April 18th; Sec. Lt. (Hon. Lt.) (actg. Lt.) F. Lewis, from (S.O.), April 25th; Lt. (actg. Capt.) E. E. Colquhoun, M.B.E., from (S.O.); Capt. (actg. Maj.) R. D. Law (W. Yorks R.), from (S.O.), April 30th.

Lt.-Col. I. A. E. Edwards, C.M.G., resigns his commn. and is permitted to retain his rank, May 7th

AIR MINISTRY, May 9th.

R.A.F.—The following temp. appointments are made :—Group Commdr.—Lt.-Col. A. M. Longmore, D.S.O., and to be actg. Col. while so empld., vice Lt.-Col. C. F. de S. Murphy, May 5th.

Staff Officer, 2nd Cl.—(O.)—Capt. O. H. Frost, M.C., May 1st.

PAYING BRANCH.—Lt.-Col. C. R. Finch-Noyes, D.S.O., A.F.C., to be Lt.-Col. (A. and S.), from (S.O.), March 5th to April 30th.

Maj. (actg. Lt.-Col.) F. H. M. O'Farrell to be Maj. (A.), and relinquishes the actg. rank of Lt.-Col. on reduction of estbt., April 11th.

Capt. T. O. Stadd, D.F.C., to be actg.-Maj. while empld. as Maj. (A.), Oct. 24th, 1918, to April 10th.

Cants. to be actg. Majs. whilst empld. as Majs. (Admin.) :—W. F. F. G. Warneford, from June 18th, 1918, to Jan 31st; A. H. Wann, from Nov. 17th, 1918, to April 30th.

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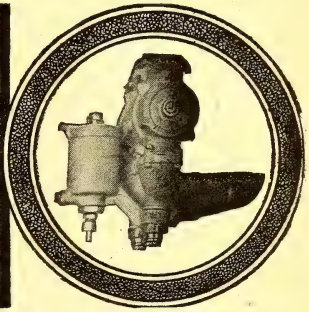
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The following Capts. (actg. Majs.) relinquish the actg. rank of Maj. on reduction of establishment :—M. S. Marsden (A.), H. J. Segrave (A.), S. St. G. C. Belfield (K.B.), April 13th.

Lts. to be actg. Capts. whilst empld. as Capts. :—C. G. Wigglesworth, A.F.C. (A'ship), Aug. 1st, 1918, to Jan. 31st; J. H. Bentham (A. and S.), June 1st, 1918, to Nov. 11th, 1918.

The following Lts. (actg. Capts.) (A.) relinquish the actg. rank of Capt. on reduction of establishment :—E. J. A. Burke, A. L. Chick, A.F.C., J. S. Chick, M.C., J. M. Glaisher, D.F.C., G. V. Howard, R. E. Heath, L. H. Jones, F. S. McClurg, R. J. Rodwell, G. H. Russell, D.F.C., R. N. Swann, W.S.C. Smith, F. B. Wilson, April 13th.

Sec. Lt. H. Lloyd-Williams to be Lt., Sept. 28th, 1918.

Sec. Lt. A. C. H. Isaac (late Res. of Off. List, R.F.C., on prob.) is confirmed in his rank of Sec. Lt. (A.), Sept. 1st, 1918

Sec. Lt. W. W. J. Debenham (late Gen. List, R.F.C., on prob.) is confirmed in his rank of Sec. Lt. (A.), Sept. 27th, 1918.

J. Morton, A.F.C. (temp. Sec. Lt., K.R. Rif.) is granted a temp. commn. as Sec. Lt. (A.), Aug. 1st, 1918

F.F.O. J. G. Hunt (late R.N.A.S.) is granted a temp. commn. as Sec. Lt. (A.), Nov. 10th, 1918.

F./Cdt. W. Davies is granted a temp. commn. as Sec. Lt. (O.), Nov. 3rd, 1918.

The following relinquish their commns. on ceasing to be empld. :—Lt. A. C. Campbell, June 15th, 1918; Lt. A. L. A. Kane (Lt., Nova Scotia R.), Dec. 16th, 1918; Lt. (Hon. Capt.) N. McL. Sandys (Capt., Can. A.S.C.), Jan. 23rd; Sec. Lt. (Hon. Capt.) C. C. Gilbert (Capt., N.Zealand Otago R.), Feb. 10th; Maj. F. H. M. Codville, M.C. (Maj., R. Can. Dragoons), March 2nd; Sec. Lt. J. Rudkin, M.C. (Sec. Lt., R.W. Surr. R.), March 31st; Capt. P. G. Bateman (Capt., Lond. R.), April 9th; Lt. J. D. Barnes (Lt., Dud. L.I., T.F.), April 12th; Lt. G. F. Bell (Lt., Yorks. R., T.F.), April 14th.

Transferred to unempld. list :—Sec. Lt. A. Schofield, Jan. 20th; Lt. G. C. Smale, Sec. Lt. E. D. Trask, R.F.A., Feb. 4th; Lt. S. Yates, Feb. 10th; Sec. Lt. C. S. Williams, Feb. 11th; Lt. F. W. Mathias, M.C., Feb. 14th; Sec. Lt. A. Somerville, Feb. 15th; Lt. C. B. Boughton, March 1st; Sec. Lt. W. P. Bryden, March 5th; Lt. N. H. Bowie, March 7th; Sec. Lt. (Hon. Capt.) M. C. Bulteel (R. Scots), Lt. A. C. Saunders, March 10th; Sec. Lt. (Hon. Lt.) G. B. Savi, March 21st; Sec. Lt. C. H. L. Needham, March 22nd; Lt. H. J. Walkerdine, M.C., Sec. Lt. T. L. Wood, March 23rd; Lt. F. A. Barker, D.F.C. (G.A.), March 24th; Lt. T. Shaw, Lt. A. P. C. Wigan, Lt. R. M. Whitmore, A.F.C., Lt. F. R. Wilson, March 25th; Sec. Lt. (Hon. Lt.) D. R. Sharman, Sec. Lt. C. E. Watson, Lt. F. J. Westfield, March 26th; Lt. W. M. Shathcarn, Sec. Lt. A. S. Vaughan, March 27th; Lt. S. H. Bingham, Sec. Lt. F. G. Rossiter, Lt. (actg. Capt.) H. Wickett, D.F.C., Lt. H. E. Wortley, March 28th; Lt. (Hon. Capt.) L. R. Speakman, March 29th, Sec. Lt. C. C. Macklem, Sec. Lt. B. H. Stretton, April 1st; Sec. Lt. M. Bonser, Sec. Lt. R. A. Gibbs, Lt. J. W. Smith, Lt. K. S. Wood, April 2nd; Capt. H. P. Dean, Sec. Lt. A. Spotswood, April 3rd; Sec. Lt. C. G. Shapland, April 4th; Sec. Lt. (Hon. Lt.) G. N. Snowball, Sec. Lt. F. Skelly, Sec. Lt. D. G. Searls, April 5th; Capt. P. Colin, M.C., Capt. (actg. Maj.) G. A. Faulkner, April 6th; Lt. W. Watson, April 6th; Sec. Lt. S. Scott, Sec. Lt. G. Wilton, April 7th; Lt. L. D. Brown, Sec. Lt. J. A. Gilchrist, Sec. Lt. J. Sheach, Sec. Lt. F. O. Townsend, Sec. Lt. W. E. Sanger, April 8th; Lt. N. Knight, Sec. Lt. A. T. Sprangle, D.F.C., Sec. Lt. A. E. V. Sadd, Sec. Lt. B. Spaven, Lt. H. M. Schlotel, Lt. M. Strang, Sec. Lt. R. J. Tomson, Sec. Lt. G. R. W. Walls, April 9th; Sec. Lt. G. R. S. Browne, Sec. Lt. W. E. Gandell, Sec. Lt. H. H. Senior, Lt. (actg. Capt.) G. J. Scaramanga, Lt. A. J. Todd (N. Staffs. R., T.F.), April 10th; Lt. G. H. H. Fox, Lt. P. Douglas, Sec. Lt. G. M. Strachan, Sec. Lt. (Hon. Lt.) M. C. Sexton, Sec. Lt. O. J. Stevenson, Sec. Lt. E. G. Tyler, April 11th; Lt. E. W. Fleming, Lt. H. J. Horsey, Lt. S. Yates, Capt. S. R. Stammers, A.F.C., April 12th; Lt. L. Booth, Capt. A. C. Burt, Sec. Lt. W. G. Cooke, Sec. Lt. R. E. La Doucer, Lt. T. B. Fenwick, Sec. Lt. S. G. Floate, Lt. C. C. Grant-Baker, Lt. W. H. Leete, D.F.C., Lt. J. J. McKenna, Sec. Lt. A. W. Sumpter, Sec. Lt. W. R. Tomlinson, Sec. Lt. C. Talboy, April 13th; Lt. E. J. Bailey, Maj. (actg. Lt.-Col.) R. Chadwick, M.C., D.C.M., Sec. Lt. W. L. Lewis, Lt. H. B. Macdonald, Lt. R. A. Markwick, Sec. Lt. H. L. Swearer, Sec. Lt. L. A. Whiting, Sec. Lt. S. H. Wheatley, April 14th; Sec. Lt. J. de F. Bailey, Sec. Lt. G. H. Bodington, Sec. Lt. T. S. Chilton, Sec. Lt. H. J. Cramphorn, Lt. H. M. Hayward, Sec. Lt. H. S. Manterfield, Lt. G. G. Miller, Sec. Lt. B. G. Pope, Sec. Lt. R. Sanderson, Lt. T. Sawyer, Lt. C. W. Snook, Lt. W. F. V. Stephenson, Sec. Lt. C. J. Sanders, Capt. D. A. Tuck, Lt. J. H. Waugh, Lt. E. F. Wilson, Sec. Lt. R. N. Wellington, April 15th; Sec. Lt. W. G. Clarke, Sec. Lt. J. Cooke, Sec. Lt. C. N. Davies, Sec. Lt. H. A. Denny, Sec. Lt. W. H. Holton, Sec. Lt. W. J. Offord, Lt. P. W. Penney, Capt. N. Starbuck, Lt. D.F.C., Sec. Lt. W. Smith, Sec. Lt. J. E. Stalley, Lt. G. Thompson, Sec. Lt. R. Tickle, Sec. Lt. M. W. White, Lt. A. S. White, Lt. H. S. Woodman, April 16th; Sec. Lt. H. V. Askham, Sec. Lt. G. P. Alexander, Sec. Lt. J. A. Beard, Sec. Lt. R. J. Browning, Sec. Lt. W. Cooper, Lt. F. J. Fogarty, Lt. R. A. Fleck, Sec. Lt. T. Lamb, Lt. J. H. Lawrence, Lt. W. E. Sulway, Sec. Lt. J. Tooth, Lt. F. A. Taylor, Sec. Lt. A. J. M. Tuck, Sec. Lt. C. L. Tench, Sec. Lt. W. H. Whale, Sec. Lt. G. Warhurst, April 17th; Sec. Lt. J. A. Bauer, Lt. A. A. M. Buschmann, Lt. (actg. Capt.) J. Collier, D.F.C., Sec. Lt. W. H. Dawkes, Sec. Lt. (Hon. Lt.) R. Michaelis, Lt. M. McGall, Sec. Lt. J. N. Marshbank, Sec. Lt. A. Pearson, Capt. F. E. Sarel, Sec. Lt. S. J. Manser, Sec. Lt. A. MacG. Mitchell, Lt. E. Wilson, Sec. Lt. P. J. Waller, Sec. Lt. A. G. White, April 20th; Sec. Lt. F. W. Le Blanc, Lt. V. R. Blow, Lt. W. F. Davenport, Lt. (actg. Capt.) W. H. Farrow, D.F.C., Sec. Lt. R. G. T. Giddens, Sec. Lt. C. E. Krouse, Lt. E. A. Peters, Lt. (actg. Capt.) P. Pike, Sec. Lt. A. D. M. Spear, Sec. Lt. O. S. Winfield, April 21st; Sec. Lt. L. L. Bridgeman, Sec. Lt. R. G. Bradbury, Sec. Lt. T. M. Cornish, Sec. Lt. J. E. H. Chadwick, Lt. R. Caldecott, Lt. H. J. Crofts, Sec. Lt. A. A. Drain, Sec. Lt. J. W. Hicks, Lt. H. N. Hooton, Sec. Lt. B. Louttit, Sec. Lt. D. R. Pettigrew, Sec. Lt. S. Toby, Lt. J. B. Weir, Sec. Lt. C. Wealthall, Lt. A. J. Yates, April 22nd; Lt. A. M. Bain, Sec. Lt. A. E. Bedborough, Lt. G. W. G. Cass, Sec. Lt. (Hon. Lt.) J. Christie, Sec. Lt. A. R. Turner, Lt. L. G. Taylor, April 23rd; Sec. Lt. W. H. Andrews, Sec. Lt. S. Abrines, Sec. Lt. T. G. Braine, Lt. C. C. Butler, Lt. E. E. Butler, Sec. Lt. A. Clarke, Sec. Lt. F. R. Greenwood, Sec. Lt. A. W. Gilbert, Sec. Lt. M. D. Moore, Sec. Lt. W. G. McGruther, Sec. Lt. J. G. Millar, Lt. (actg. Capt.) E. E. Morris, Lt. F. H. Prime, Sec. Lt. (Hon. Lt.) E. F. Smallbone, R.F.A., Lt. G. N. Sellers, D.F.C., Sec. Lt. N. C. Shergold, Sec. Lt. W. H. Welsh, April 24th; Sec. Lt. C. E. F. Arthur, Sec. Lt. C. M. Barker, Sec. Lt. R. A. Broadbank, Lt. (actg. Capt.) L. G. Banks, Lt. G. H. Baker, Lt. (actg. Capt.) C. L. Bruce, Lt. (actg. Capt.) E. L. Crowe; Sec. Lt. D. M. David, Lt. L. W. King, Sec. Lt. (Hon. Lt.) L. W. Morgan, Sec. Lt. F. D. R. McLaren, Sec. Lt. I. R. Marsh, Sec. Lt. A. L. Stewardson, Sec. Lt. F. W. Trench, Sec. Lt. F. C. Thomas, Sec. Lt. (Hon. Lt.) J. C. Thompson, Lt. F. R. S. Wickham, Sec. Lt. N. F. J. Wise, Sec. Lt. A. R. B. Woodiwiss, April 25th; Sec. Lt. A. H. Barber, Lt. B. B. Ball, Lt. R. W. Cash, Sec. Lt. E. L. Chafe, Sec. Lt. C. E. Little, Sec. Lt. L. S. McCullagh, Sec. Lt. A. C. Precious, Sec. Lt. H. E. Varley, Sec. Lt. F. K. White, Lt. C. H. Wallis, Sec. Lt. G. West, April 26th; Sec. Lt. (Hon. Lt.) H. H. Butler, Sec. Lt. N. H. Toin, Sec. Lt. M. Saynor, April 27th; Sec. Lt. D. D. H. Craig, Sec. Lt. (Hon. Lt.) N. Peters, Lt. H. C. Reeve, April 28th; Capt. A. V. Bowater, Lt. F. A. Barratt, Lt. R. G. Clough, Maj. B. P. Greenwood, Capt. G. D. F. Keddie, Sec. Lt. (Hon. Lt.) C. H. Scaddon (York and Lanc. R.), Sec. Lt. G. J. Sansum, Sec. Lt. F. W. Swain, Sec. Lt. S. L. Simpson, April 29th; Lt. (actg. Capt.) C. R. Alston, Sec. Lt. A. Bates, Sec. Lt. H. Cahill, Lt. (actg. Capt.) D. M. McGoun, M.C., Capt. P. C. C. Passman, Maj. (actg. Lt.-Col.) A. K. Tyler, O.B.E., May 1st; Lt. J. A. Amor, May 2nd; Sec. Lt. P. M. Barr, Lt. F. J. Dawson, Sec. Lt. H. MacD. Staike, D.F.C., May 8th; Sec. Lt. L. J. Bradley, May 9th.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—C. H. Dunster (contracted on active service), April 24th; F. E. Robinson (contracted on active service), April 4th (substituted for notification in "Gazette," Jan. 17th); F. Green (substituted for notification in "Gazette," Dec. 6th, 1918), J. A. Harkin (substituted for notification in the "Gazette" of Feb. 25th), May 9th.

Lt. J. N. Raby resigns his commn., May 9th.

Sec. Lt. F. T. Mollard relinquishes his commn. on account of ill-health, May 10th (substituted for notification in "Gazette," Jan. 14th.

Lt. R. J. Stallard to take rank and prec. as if his appointment as Lt. bore date Oct. 1st, 1918.

The following Sec. Lts. are dismissed the Service :—J. N. MacDonald, for absence without leave, Dec. 2nd, 1918; J. B. Wickham, April 16th.

G. A. Thompson is antedated in his appointment as Sec. Lt. (A), Aug. 27th, 1918.

The appointment of Sec. Lt. R. C. Van Der Beu, M.C., is antedated to Sept. 22nd, 1918.

The surname of Sec. Lt. C. Walter is as now described, and not as stated in "Gazette," June 14th, 1918.

The notification in "Gazette," Feb. 25th, concerning Lt. H. G. Smith (Nova Scotia R.) is cancelled.

The notification in "Gazette," March 4th, concerning Sec. Lt. R. Clark is cancelled.

ADMINISTRATIVE BRANCH.—Lt. (Hon. Capt.) (actg. Capt.) C. H. Lewis to be actg. Maj. whilst empld. as Maj., from Jan. 12th to April 30th.

Capt. S. M. Wood to be Capt., from (S.O.), May 1st.

Lt. E. Winter to be actg. Capt. whilst employed as Capt. from Oct. 18th, 1918, to April 30th.

Lt. (hon. Capt.) (actg. Capt.) G. Chetwynd-Stapylton relinquishes the actg. rank of Capt. on reduction of establishment, April 13th.

K. E. Clayton (temp. Capt., Somerset L.I.), is granted a temp. commn. as Lt., Aug. 10th, 1918, and to be hon. Capt., with secy. from April 1st, 1918.

Lt. (actg. Capt.) A. A. Denison, M.B.E., M.C., to be Lt., and relinquishes the actg. rank of Capt. on ceasing to be employed as Capt., (A), April 17th.

Lts. (A) to be Lts. :—C. L. De Beer, L. Duffus, H. Hammond, M.C., J. McM. McLennan, D.F.C., F. F. Morris, G. D. Rowden, E. S. C. Senn, G. M. Smith, A. D. Whitehead, April 17th.

H. D. Evans, April 24th.

Lt. W. E. Wright to be Lt., from (K.B.), April 17th.

Lts. (O.) to be Lts. :—N. T. Berrington, J. M. Brisbane, M.C., W. M. E. Chesney, M.C., April 17th.

Sec. Lt. H. J. Young to be Lt., Dec. 21st, 1918.

Sec. Lt. (Hon. Capt.) C. J. P. Copner to be actg. Lt. whilst empld. as Lt., from (K.B.), from July 29th, 1918, to April 30th (substituted for notification in "Gazette," Dec. 31st, 1918).

Secs. Lts. to be promoted to be actg. Lt. whilst specially employed from April 29th to April 30th.

Sec. Lt. T. H. Hesketh to be Sec. Lt., from (A), April 17th.

Sec. Lt. H. H. Ffrench to be Sec. Lt., from (O), April 17th

A. Buckley is granted a temp. commn. as Sec. Lt., April 30th, 1918.

The following Lts. relinquish their commns. on ceasing to be empld. :—Capt. F. C. Barrett (Fife and Forfar Yeo.), Feb. 25th; Lt. J. P. D. Mostyn (Lt., R. Suss. R.), March 5th; Lt. F. H. Ward (W. Yorks R., T.F.), March 7th; Lt. R. St. J. Hartley (Devon R.), March 12th; Lt. J. E. S. P. Bradford, M.C. (W. Rid. R.), April 10th, Lt. W. A. Waterman (Border R.), April 14th.

Transferred to the unempld list :—Lt. H. Beer, Feb 14th; Lt. R. K. Knowles, March 21st; Lt. A. A. Weston, March 26th; Sec. Lt. C. E. Sainsbury, March 27th; Sec. Lt. R. H. P. West, March 29th; Sec. Lt. S. J. Stagg, March 31st; Capt. (actg. Maj.) J. Dickinson, April 1st; Lt. (actg. Capt.) W. Davis, Lt. (Hon. Capt.) J. C. Stephen, Lt. (Hon. Capt.) S. W. Southwood, Lt. N. F. Spurr, April 9th; Sec. Lt. L. C. Hatton, April 10th; Sec. Lt. (Hon. Lt.) E. D. Edwards, April 11th; Sec. Lt. G. K. Austin, Lt. (actg. Capt.) J. N. Stephens, April 12th; Sec. Lt. L. C. Shepherd, April 15th; Sec. Lt. R. E. Edwards, Sec. Lt. C. H. Westwater, April 14th; Capt. B. Ayrton, Sec. Lt. W. H. Brennan, Sec. Lt. (Hon. Lt.) L. R. Ellwood, Lt. (hon. Capt.) J. A. Mansfield, Lt. T. C. F. Paice, Sec. Lt. E. G. Stott, April 15th; Lt. R. K. Fletcher, Sec. Lt. C. A. Henshaw, Sec. Lt. (actg. Capt.) A. E. Marriott, Lt. A. S. Windsor, April 16th; Lt. J. A. Kirker, Sec. Lt. M. R. Skinner, April 18th; Lt. L. W. H. Bertie, April 19th; Lt. W. H. Chatham, Sec. Lt. E. Clark, Sec. Lt. J. G. Collins, Sec. Lt. G. M. Coull, Sec. Lt. (Hon. Lt.) C. B. Marshall, Sec. Lt. H. N. Sauer, April 22nd; Sec. Lt. S. E. Baile, Sec. Lt. R. T. Bark, April 23rd; Lt. D. E. Morrison, April 24th; Lt. (actg. Capt.) D. E. B. Shinwright, April 25th; Sec. Lt. F. H. Wall, April 26th; Lt. (actg. Capt.) F. B. Beddington, Sec. Lt. C. W. Clarke, May 1st.

Sec. Lt. C. H. Cotton relinquishes his commn. on account of ill-health contracted on active service, Nov. 1st, 1918 (substituted for notification in "Gazette," Jan. 21st).

Sec. Lt. J. R. McCormack is removed the Service, his Majesty having no further occasion for his services as an officer, Feb. 28th.

Sec. Lt. A. Coates is removed the Service for absence without leave, Sept. 13th, 1918.

The notification in "Gazette," April 11th, concerning Lt. (actg. Capt.) D. H. Robertson, A.F.C., is cancelled.

The notification in "Gazette," April 8th, concerning Sec. Lt. S. D. Good is cancelled.

TECHNICAL BRANCH.—Maj. (actg. Lt.-Col.) C. Barber to be Maj., and relinquishes the actg. rank of Lt.-Col., March 20th.

Maj. C. Barber to be graded for purposes of pay and allowances of Lt.-Col., Grade (B), April 22nd.

Lt. (actg. Capt.) E. A. Braddock to be graded for pay and allowances of Capt. while empld. as Capt., Grade (A), April 1st.

Lt. L. F. de Peyrecave to be actg. Capt. while specially empld. at the Ministry of Munitions from Aug. 17th, 1918, to April 30th

Lt. W. J. Bunting to be actg. Capt. while empld as Capt., Grade (B), from Nov. 1st, 1918, to April 30th.

Sec. Lt. (Hon. Lt.) A. Ward to be actg. Capt. while specially empld. at the Ministry of Munitions from Aug. 25th, 1918, to April 30th.

Sec. Lt. B. H. Sagar to be actg. Capt. while holding a special appointment at the Ministry of Munitions from Dec. 1st, 1918, to April 30th.

Sec. Lt. (actg. Capt.) W. K. D'A. de Ferrars to be Lt., April 5th, 1918.

Sec. Lts. to be Lts. without pay and allowances of that rank :—(Hon. Lt.) R. V. Weekes, May 23rd, 1918; C. B. Stamp, Oct. 15th, 1918.

Sec. Lt. H. G. Murphy to be actg. Lt. while empld. as Lt., Grade (B), from Dec. 3rd, 1918, to April 30th.

Sec. Lts. to be Sec. Lts. (Grade A) from (A.O.) :—H. D. Olson, Nov. 26th, 1918 (substituted for notification in "Gazette," Dec. 13th, 1918); P. F. Jessop, Jan. 1st; A. E. Chester, Feb. 21st.

Sec. Lts. to be Sec. Lts., Grade (B) from (A.O.) :—A. N. Ramsey, Jan. 16th; J. G. Smithson, April 29th

Sec. Lt. E. G. Grafton (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt., Grade (B), Feb. 15th.

Transferred to unempld. list:—Sec. Lt. J. R. Salmon, Feb. 23rd; Lt. J. F. B. Smith, March 9th; Sec. Lt. R. O. Cherry, March 8th. Sec. Lt. E. B. Gray, Sec. Lt. T. H. Swarbrick, March 21st; Lt. (actg. Capt.) W. D. Squire, March 25th; Sec. Lt. G. E. H. Smith, March 26th; Maj. A. E. Snape, Capt. W. Shearer, March 31st; Sec. Lt. R. J. Hibberd, April 1st (substituted for notification in "Gazette," April 11th); Capt. (Hon. Maj.) (actg. Maj.) G. S. M. Taylor, April 2nd; Capt. J. W. Gordon, April 6th; Capt. R. G. Shire, April 9th; Sec. Lt. G. G. Kirby, April 12th; Sec. Lt. F. C. Starkey, April 11th; Capt. L. W. Carr, Sec. Lt. C. J. Skidmore-Jones, Sec. Lt. H. G. Moon, Sec. Lt. G. H. Saunders, April 12th; Sec. Lt. V. C. Crook, Sec. Lt. J. D. E. Symons, April 13th; Capt. D. H. Kemp, Sec. Lt. B. O. Nash, Lt. F. J. Standerwick, April 15th; Sec. Lt. (actg. Lt.) J. Anderson, Sec. Lt. W. J. Atterton, Sec. Lt. W. Blakemore, Sec. Lt. (Hon. Lt.) V. E. Faning, Lt. C. G. A. R. Spry, Lt. F. M. Pepper, Lt. A. L. Simms, April 16th; Sec. Lt. (actg. Capt.) A. J. Corbitt, Lt. J. W. Clark, April 17th; Sec. Lt. (actg. Lt.) E. W. Dexter, Sec. Lt. H. J. Neill, April 19th; Sec. Lt. (Hon. Lt.) E. W. Hallam, April 21st; Lt. W. C. Cambray, M.C., April 22nd; Sec. Lt. C. P. L. Cheams, Sec. Lt. D. H. Fenner, Sec. Lt. O. E. C. Taylor, Capt. J. M. Macaulay, Lt. (actg. Capt.) S. A. Mitchell, April 23rd; Maj. (actg. Lt.-Col.) A. H. W. Skitt, April 24th; Lt. (actg. Capt.) L. T. Beddow, Sec. Lt. (Hon. Lt.) B. J. Mitchell, Capt. S. E. Spencer, April 25th; Capt. P. A. Supee, April 27th; Capt. (actg. Maj.) W. Park, May 1st; Sec. Lt. J. Tunnadine, May 2nd.

Sec. Lt. W. N. Edwards to take rank and prec. as if his appointment as Sec. Lt. bore date Oct. 1st, 1918.

Sec. Lt. C. W. O'Brien resigns his commn., May 10th.

The notification in "Gazette," Feb. 25th, concerning Sec. Lt. P. H. C. Martin is cancelled.

MEDICAL BRANCH.—E. L. Sergeant is granted a temp. commn. as Lt., May 8th.

Transferred to unempld. list: Capt. M. R. O. Wilson, April 6th; Capt. (actg. Maj.) A. Scott-Turner, April 8th; Lt. G. M. Wishart, April 16th; Lt. B. R. B. Truman, I. M. Thomson, April 17th; Capt. S. Robertson, April 25th.

DENTAL BRANCH.—Lt. V. E. Mills is transferred to the unempld. list, April 17th.

MEMORANDA.—All officers of the Royal Air Force holding actg. rank relinquish such rank with effect from May 1st and revert to their substantive rank in the Royal Air Force List, with the exception of officers belonging to the forces engaged in operations in Russia, the undermentioned officers who will hold the actg. rank stated against their names and other officers who may hereafter be gazetted to actg. rank:—

To be actg. Brig.-Gens.:—Col. A. V. Vyvyan, C.B., D.S.O., whilst empld. as an Area Comdr.; Col. P. W. Game, C.B., D.S.O., whilst empld. as a Director; Col. O. Swann, C.B., whilst holding an independent comd.; Col. B. H. H. Cooke, C.M.G., D.S.O., whilst officiating as an Area Comdr.; Col. H. R. M. Brooke-Popham, C.M.G., D.S.O., A.F.C., whilst empld. as a Director; Col. J. M. Maitland, C.M.G., D.S.O., whilst specially empld.; Col. C. L. Lambe, C.M.G., D.S.O., whilst empld. as Director; Col. J. M. Steel, C.B.E., whilst empld. as a Brig.-Gen. Air Staff; Col. C. A. H. Longcroft, C.M.G., D.S.O., A.F.C., whilst empld. as an Area Comdr.; Col. T. I. Webb-Bowen, C.M.G., whilst empld. as an Area Comdr.; Col. C. J. Charlton, C.B., C.M.G., D.S.O., whilst empld. as an Air Attaché; Col. R. M. Groves, C.B., D.S.O., A.F.C., whilst empld. as Deputy Chief of the Air Staff; Col. J. H. W. Becke, C.M.G., D.S.O., whilst empld. as Brig. Commdr.; Col. R. E. T. Hogg, C.M.G., C.I.E., whilst empld. as Brig. Commdr.; Col. E. L. Gerrard, C.M.G., D.S.O., whilst holding an independent command; Col. M. H. G. Fell, C.B., C.M.G., whilst empld. as a Director; Col. P. R. C. Groves, D.S.O., whilst specially empld.; Lt.-Col. R. K. Bagnall-Wild, C.M.G., whilst empld. as a Director; Lt.-Col. P. L. W. Herbert, C.M.G., whilst officiating in comd. of the R.A.F. in the Middle East; Lt.-Col. N. D. K. MacEwen, C.M.G., D.S.O., whilst holding an independent command.; Lt.-Col. C. Maitland, D.S.O., whilst empld. as a Director.

To retain relative rank of Brig.-Gen.:—Rev. H. D. L. Viener, M.A., while empld. as Chaplin-in-Chief.

To be actg. Cols.:—Lt.-Col. R. C. S. Hunt; Lt.-Col. C. R. Samson, C.B., D.S.O.; Lt.-Col. E. H. Clark-Hall, D.S.O.; Lt.-Col. M. P. Ashstoney, C.B.E., while empld. at the Central Pay Office; Lt.-Col. A. M. Longmore, D.S.O.; Lt.-Col. A. W. C. McFall, while empld. as permanent President of Courts Martial; Lt.-Col. F. H. G. Playfair, while empld. as permanent President of Courts Martial; Lt.-Col. T. Curtiss; Lt.-Col. A. V. Bettington, C.M.G., while specially empld.; Maj. W. P. Alexander, while empld. as permanent President of Courts Martial; Maj. H. C. Ellis, C.B.E., while in charge of the Gen. Services Pay Office.

To retain the relative rank of Col.:—Rev. R. E. V. Hanson, M.A., while empld. as Dep. Chaplain-in-Chief; Rev. S. L. Clarke, M.A., B.Sc., while empld. as Dep. Chaplain-in-Chief; Rev. S. J. Jones, M.C., while empld. as Principal Chaplain; Rev. H. Dey, D.S.O., while empld. as Principal Chaplain; Rev. R. Hall, while empld. as Principal Chaplain; Rev. W. Moffat, while empld. as Principal Chaplain.

To be actg. Lt.-Cols.:—Maj. E. R. Peal, O.B.E., D.S.C., while specially empld.; Maj. W. D. S. Sanday, D.S.O., M.C., while empld. as an Air Attaché; Maj. T. C. Pearson, D.S.O., A.F.C., as the commd. a Group; Maj. H. A. Moore, C.B.E., M.C., while empld. as Staff Officer, 1st Cl.; Maj. Sir N. R. A. D. Leslie, Bt., C.B.E., while empld. as an Air Attaché; Maj. D. Mackenzie, while empld. as Permanent President of Courts Martial. Maj. H. B. Bonning, while empld. as Officer in Charge of Records; Maj. R. Goble, D.S.O., O.B.E., D.C., while specially empld.; Maj. D. Harries, A.F.C., while specially empld.; Maj. H. C. T. Langdon, while empld. as Principal Med. Officer of an Area; Capt. E. S. Halford, O.B.E., while specially empld.

To be actg. Majs.:—Capt. C. L. Bullock, O.B.E., while specially empld.; Capt. F. Clark, while empld. as Area Representative on Quartering Committees; Capt. A. C. Maclaren, M.C., A.F.C., while specially emplds.; Capt. R. F. S. Leslie, D.S.C., D.F.C., whilst specially emplds.; Capt. D. C. James, whilst specially emplds.; Capt. W. J. King, D.C.M., while emplds. as Area Representative on Quartering Committees; Lt. W. H. Holroyd, whilst emplds. at the Central Pay Office; Lt. G. Arthur, whilst emplds. as Area Representative on Quartering Committees; Lt. C. J. Brockbank, whilst emplds. at R.A.F. Record Office; Sec. Lt. A. R. Fulton, whilst specially emplds.

To be actg. Capts.:—Lt. G. F. Ansell, whilst emplds. at the Central Pay Office, Lt. W. H. Tyall, M.B.E., whilst emplds. at the Central Pay Office; Sec. Lt. C. T. Johnson, whilst emplds. at the Central Pay Office; Sec. Lt. A. S. Fortescue, O.B.E., whilst emplds. at the Gen. Services Pay Office; Lt. F. D. Peters, whilst employed at the Gen. Services Pay Office; Sec. Lt. I. Wardle, whilst emplds. at the Central Pay Office; Sec. Lt. S. W. Hodgkinson, whilst emplds. at the Gen. Services Pay Office; Lt. R. C. Vaughan, M.C., whilst emplds as Courts-Martial officer; Lt. G. Norrington, whilst emplds. as Courts-Martial Officer; Lt. M. J. Norton, whilst emplds. as Courts-Martial Officer; Lt. A. B. Langridge, whilst emplds. as Courts-Martial Officer; Lt. E. S. C. Brooks, whilst emplds. as Courts-Martial Officer; Sec. Lt. J. H. Slingsby, whilst emplds. as Courts-Martial Officer; Sec. Lt. G. T. Armitage, whilst emplds. as Courts-Martial Officer; Sec. Lt. J. E. H. Cochrane, whilst emplds. as Courts-Martial Officer.

To be actg. Lts.—Sec. Lt. W. F. Swan whilst emplds. at the Central Pay Office; Sec. Lt. F. T. L. Avis, whilst emplds. at the Central Pay Office; Sec. Lt. F. C. Bird, whilst emplds. at the Central Pay Office; Sec. Lt. E. G. Bourne, whilst emplds. at the Central Pay Office; Sec. Lt. W. G. Chatz, whilst emplds. at the Central Office; Sec. Lt. F. W. Headey, whilst emplds. at the Central Pay Office; Sec. Lt. L. J. Marden, whilst emplds. at the Central Pay Office; Sec. Lt. J. L. Saxton, whilst emplds. at the Central Pay Office; Sec. Lt. H. Balls, whilst emplds. at the Central Pay Office; Sec. Lt. S. J. Croad, whilst emplds. at the Gen. Services Pay Office.

The following Overseas Cadets are granted temp. commns. as Sec. Lts.: 154858 H. W. Hales, 316211 D. Hudson, 171493 S. Holmes, 316170 E. C. Hatch, 223370 T. J. Hanrahan, 316063 J. H. Hewson, 116670 E. Hills, 71813 H. N. Hurle, 172406 J. A. Hoey, 4677 C. C. Harvie, 171877 C. Hughes, 171281 L. B. Harris, 775714 C. B. Horton, 531828 R. D. Hudgar, 513162 W. J. Ham, 171925 J. Hudson, 316296 E. L. Hollver, 331246 J. Innes, 310276 S. S. Jones, 310191 P. G. Jordan, 171920 J. J. Jaffe, P/1415 W. Johnson, 154619 T. C. Johin, 172199 E. A. Jamieson, 181335, S. G. Jones, 284 J. H. Judd, 316370 H. R. Jenks, 172590 E. S. Kielly, 316176 U. C. Knaggs, 188766 H. R. Kitchen, 530020 G. M. Keely, 154796 W. W. Kline, 1098332 A. Kidd, 808313 H. E. Keith, 563431 A. P. Knechtel, 316110 C. Kennedy, 172226 J. P. La Chapelle, 910999 R. Leitch, 154989 A. A. Lee, 179765 E. W. Lemire, 171833 A. Le Blanc, 171914 J. D. Latham, 171897 J. S. Laurie, 2813 D. Low, 171310 N. M. Lee, 172244 J. D. Lebonte, 925297 B. N. Laubach, 171924 W. Lloyd, 172607 S. M. Leigh, 154717 A. B. Lackie, 172602 H. Ludgate, 171706 W. A. Mason, 171287 K. D. MacMillan, 171928 E. McNutt, 171939 A. McGougan, 184600 G. D. Mann, 316349 W. H. McKenzie, 316236 C. W. Morrow, 171682 H. A. Macdonald, 316108 R. I. Mark, 476330 W. A. Munday, 153851 H. C. Mahee, 171494 E. C. Mapson, 154722 C. P. McCrimmon, 171573 D. N. Mooney, 28763 J. S. Moysey, 310255 G. L. McIntosh, 214128 D. Muir, 505372 J. R. MacNeill, 154386 W. J. Maddigan, 172104 G. Milson, 171167 M. L. Moore, 171813 J. S. McArthur, 4802 H. C. McFayden, 171114 F. H. McCormick, 316007 R. M. Myers, 310289 D. J. McIntosh, 117088 F. G. McKinnon, 126608 R. J. McMurray, 331666 G. F. Moti, 172096 L. MacClashan, 316167 E. D. McDougal, 153113 G. L. McLachlan, 171505 J. McDonald, 404904 C. McNally, 153632 W. J. McLelland, 170830 J. C. McNeill, 312654 W. C. McKinnaly, 760184 R. J. McCloskey, 316004 D. Mitchell, 171392 E. W. McTaggart, 524490 W. McKenzie, 316951 R. G. Milne, 304595 C. V. McFarlane, 171597 L. MacLachlan, 171968 G. A. McMann, 487395 T. W. McPhee, 171909 S. R. Masten, 173005 H. B. Moore, 154984 N. A. Marshall, 172506 W. J. MacDonald, 154823 R. E. Neilles, 310933 J. A. McCleavey, 171911 C. Maguire, 172146 C. G. Morehouse, 152728 M. Merterson, 181335, J. W. McDonald, 316013 E. H. A. Martin, 123870 M. W. Manson, 316375 A. G. Muir, 154353 W. McHenry, 415502 J. W. Mackay, 170811 F. J. McCloskey, 316379 E. E. Miller, 171172 H. S. Martindale, 681788 W. R. McCullough, 316228 H. C. Norris, 160030 T. Norton, 170679 G. W. Norman, 154140 W. G. Nixon, 316126 A. J. Nesbitt, 171851 W. A. North, 171655 C. H. O'Meara, 171699 J. J. C. O'Ryan, 316242 J. B. O'Neill, 171427 A. K. Owen, 172332 T. B. O'Conner, 172095 W. E. F. Owens, 331189 W. C. Osbourne, 218827 D. H. Overy, 170773 W. A. Peterson, 316193 D. Piggott, 511861 H. W. Peacocke, 171758 H. Poole, 310190 D. Palmer, 257510 H. C. Perry, 154922 W. L. Phinn, 1051666 R. Pascall, 154802 H. S. Penfold, 171693 H. Peters, 170787 J. R. Proctor, 171554 A. F. Popplewell, 748003 E. St. J. Paquette, 430190 W. W. Pettigrew, 156239 J. S. Robinson, 513586 H. E. Ryerson, P/222 J. W. Randolph, 172491 H. L. Rousseau, 154045 A. J. Rankine, 171840 W. Rennie, 316111 G. N. Rivers, 172011 R. N. Ripley, 154744 J. A. Rea, 123869 G. H. Reed, 172112 R. Rookwood, 92866 J. W. Regan, 154761 G. Robins, 154881 O. E. Rogers, 524577 G. Redgrave, 171950 R. F. Remnant, 171732 D. Richardson, 171657 J. C. Rimmington, 316011 C. G. Roome, 171571 W. H. Richards, 157112 A. E. Ribey, 154702 W. B. Reid, 318981 A. Smith, 170845 J. A. Semple, 154274 C. J. Short, 154943 W. Smythe, 730731 H. J. Schorer, 316161 R. W. Smith, 535685 L. Smallwood, 171847 R. A. Swallow, 154323 S. P. Stuart, 154963 J. C. Simpson, 172098 C. Stanley, 316328 W. F. Seller, 135568 A. S. Simpson, 316243 F. S. Seaborne, 531122 R. H. Spick, 171528 J. Stacey, 316240 J. M. Seck, 316150 R. Squarebriggs, 22294 B. Schurman, 152366 R. G. Simpson, 155774 O. M. Schwindt, 171348 R. B. Stewart, 171173 G. W. Shuff, 171761 W. Strangeway, 154668 G. U. Smith, 528661 M. A. Stevens, 316302 T. W. Spraggon, 153750 S. Smith, 171699 R. W. Smith, 171889 J. R. Sharp, 171910 C. H. Sifton, 132522 S. W. Shaw, 263 R. Sheard, 172102 C. H. Tatum, 252401 C. H. Theedom, 438239 F. L. Thomas, 154279 C. M. Tobin, 316041 S. S. Thompson, 171873 A. S. Townsend, 709206 J. E. Tye, 316032 G. M. Townsend, 154579 J. M. Treleaven, 1016567 R. Th Taylor, 154822 J. Townsend, 172160 R. Thompson, 171809 W. Tarlton, 154 A. S. Thomas, 219532 G. K. Thompson, 171469 R. J. Tuffnail, 171617 P. D. L. Vahey, 181613 R. P. Valtier, 172133 P. A. Valois, 316251 L. Weber, 172059 C. A. Weir, 303353 A. O. Wilson, 54026 A. O. Winter, 907682 R. White, 171126 F. G. Wallace, 310272 L. West, 171636 C. S. Wilson, 154853 J. R. Woodhouse, 316972 T. J. Wilson, 171138 F. Williams, 172426 W. J. Way, 778233 M. E. Watts, 316274 C. T. Wrigglesworth, 348620 V. Walker, 154698 L. A. Workman, M/2152852 F. White, 172533 J. A. Weir, 164722 J. E. Worth, 154885 N. E. Ward, 147805 O. Willows, 172010 F. L. Woodruff, 172098 H. Welch, 153556 G. Watson, 316048 J. P. Weagant, 316066 F. H. White, 316099 A. O. Wilson, 316374 A. S. Window, 190311 E. M. Webber, 363065 R. B. Watson, 171641 H. White, Feb. 15th.

Temp. Hon. Capt. H. Longton relinquishes his commn. on ceasing to be empld., April 16th.

Transferred to the unempld. list:—Lt. (actg. Capt.) J. M. Watson (S.O.), March 29th; Lt. (actg. Capt.) G. C. Wingrove (S.O.), March 31st; Lt. (Hon. Capt.) (actg. Capt.) W. T. Taylor (S.O.), April 2nd; Capt. (actg. Maj.) M. H. Davies, M.C. (S.O.), April 4th; Capt. (actg. Lt.-Col.) T. M. Eggar, O.B.E. (S.O.), April 15th; Lt. (actg. Capt.) W. B. Garrett, from (S.O.); Capt. S. D. Felkin, M.B.E., from (S.O.), Maj. (actg. Lt.-Col.) S. R. Lowcock, from (S.O.), Capt. C. A. Slater, from (S.O.), April 16th; Capt. (actg. Maj.) C. L. D. Willcox, from (S.O.), Capt. (actg. Maj.) G. Whale, from (S.O.), April 23rd; Capt. L. P. D. Cooper, from (S.O.), Lt. (Hon. Capt.) (actg. Maj.) F. Lindsay, from (S.O.), April 24th; Capt. R. D. Hallam, from (S.O.), April 28th; Maj. C. W. Gamble, O.B.E., from (S.O.), April 29th; Capt. (actg. Maj.) H. H. Walmsley, from (S.O.), April 30th; Maj. C. F. Krabbe, O.B.E., from (S.C.), Capt. J. E. Morris, from (S.O.), May 1st.

Capt. (Hon. Maj.) W. G. M. Sarel (Rif. Bde.), from (S.O.), relinquishes his commn. on account of ill-health. May 7th

Lt. J. More resigns his commn, May 10th.

FROM THE COURT CIRCULAR.

WINDSOR CASTLE, May 8th.

The King, attended by the Gentlemen in Waiting, went to London this morning.

His Majesty held an Investiture in the Quadrangle of Buckingham Palace at 11 o'clock.

The following were severally introduced into the presence of His Majesty, when the King invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:—

THE DISTINGUISHED SERVICE ORDER.—Major Hugh Reilly, Indian Army, attached R.A.F.

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE (MILITARY DIVI-

SION).—Officers.—Major Chester Duffus, R.A.F. (also received the Military Cross); Philip Hoyland, R.A.F.

His Majesty then conferred decorations as follows:—

THE DISTINGUISHED SERVICE CROSS.—Captain Edward Burling, R.A.F.

THE MILITARY CROSS.—Maj George Gardner, (Yorkshire R.), attd. R.A.F.; Capt. John Brown, R.A.F.; Capt. Herbert Drewitt, R.A.F.; Capt Leslie Edwards (Middx R.), attd. R.A.F.; Capt. Robert Kirkman, R.A.F.; Lieut. Stafford Jackson, R.A.F.; Lieut. Arthur Lancashire, R.A.F.; Lieut. Raoul Lucovich, R.A.F.

ADMIRALTY APPOINTMENTS.

The following appointments have been made:—

May 7th.—Art. Engr.—J. Welham, to "Furious," (May 5th).

May 8th.—R.N.R.—Lieuts.—W. T. Lane, to "Pegasus," (April 17th).

OFFICIAL COMMUNIQUES.

The Secretary of State for India makes the following announcement: May 9th.—Indian agitators are stated, in a report received from Afghan sources, to have pledged themselves to attack on aircraft and mechanical transport and to incendiarism.

* * *

The India Office issued the following communiqué on May 12th:—

Since the official statement was published on May 8th regarding recent developments on the Afghan border, further telegrams have been received from the Government of India on the subject. On May 9th the Government of India reported that the Afghans were receiving large reinforcements, and had advanced their positions to the heights of Ashrafai Khel, overlooking Landi Kotal. On May 10th the Government of India telegraphed as follows:—

On the morning of May 6th our advanced forces at Landi Kotal expelled Afghans from positions in vicinity of that locality. Aeroplanes co-operated and bombed Loi Dakka with good results. Enemy are still in position to the west about Khar Gali. Our casualties were slight.

THE CASUALTY LIST.

MILITARY.

Reported May 13th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—McFerran, Lt. T. M., R.F.C.

PERSONAL NOTICES.

NAVAL.

BIRTH.

LONGMORE.—On May 6th, at Witley Manor, Godalming, the wife of Colonel A. M. Longmore, D.S.O., R.A.F. (late Wing Comdr., R.N.), of a son.

MILITARY.

DEATHS.

BEANLANDS.—Capt. Bernard Paul Gascoigne Beanlands, M.C., R.A.F., who died on May 8th, at Northolt, was the son of the late Canon Beanlands, rector of Christ Church Cathedral, Victoria, B.C., and Mrs. Beanlands. He was 21 years of age.

ROBINSON.—Major Hugh Huntley Robinson, M.C. and bar, R.A.F.M.S., 9th Wing, R.A.F. (late M.O. 21st London Regt.), who was killed on May 3rd in an aeroplane accident at Mons, was the second son of Dr. and Mrs. H. Shapter Robinsen, of "Crantock," Denham Road, Epsom. He was 29 years of age.

ENGAGEMENTS.

COPEMAN—CLAYTON.—The marriage of Major Martin George Byard Copeman, Leicestershire Regt. and R.A.F., son of the late Mr. and Mrs. Thomas Copeman, of Aylsham, Norfolk, to Ianthe, daughter of the late Capt. John William Clayton, 13th Hussars, and Mrs. Clayton, of 8, Onslow Gardens, S.W., and Felpham House, Sussex, will take place at St. James's, Piccadilly, on May 26th, at 2.30.

GRINNELL-MILNE—VAN BLOKLAND.—A marriage has been arranged, and will shortly take place very quietly, between Capt. Douglas Grinnell-Milne, late Royal Fusiliers and R.A.F., elder son of Mr. George Grinnell-Milne, 23, Ennismore Gardens, and Madame la Baronne Olga Beelearts van Blokland, of The Hague.

LESLIE—SEWELL.—The engagement is announced between Lieut. Colonel Sir Norman Leslie, Bt., C.B.E., Central India Horse and R.A.F., Air Attaché to the British Embassy, Paris, only son of the late Sir Charles Henry Leslie, Bt., Indian Army, and Betty Elise, second daughter of Mr. J. T. B. Sewell, C.B.E., LL.D., and Mrs. Sewell, of 47, Boulevard Lannes, Paris.

MACFARLANE — ATKINSON.—The engagement is announced of Lieut. Ruthven M. C. Macfarlane, M.C., R.F.A., attd. R.A.F., son of Mr. and Mrs. Ruthven Macfarlane, of Anerley, Eastbourne, and Muriel, younger daughter of the Rev. and Mrs. F. Atkinson, of Blackwater House, The College, Eastbourne.

ST. AUBYN KING—DEMUTH.—A marriage has been arranged, and will shortly take place, between Major J. St. Aubyn King, Indian Army and R.A.F., and Jeanne, only daughter of Mr. and Mrs. W. E. Demuth, late of Nyasaland.

BIRTH.

PALMER.—On May 6th, at Glentworth, Tenby, the wife of Major L. E. Palmer, York and Lancaster Regt., attd. R.A.F., of a son.

AIR FORCE.

DEATHS.

ADAMS.—Capt. Allen Percy Adams, D.F.C., R.A.F., who died in Mesopotamia on March 6th, was the only son of Colonel and Mrs. P. Adams, of Oaklands, Halstead, Essex.

DAVIS.—Sec. Lieut. Davis, R.A.F., was killed while flying an aeroplane near Crail, Fife. The aeroplane crashed into the gable of a building and caught fire. Mr. Davis' home was in Essex.

EVANS, STOKES, AND FILLMORE.—The bodies of Capt. L. L. Meredith Evans, R.A.F., Sec. Lieut. A. Stokes, R.A.F., and Serjeant Reginald Frank Fillmore, R.A.F., were picked up in the Channel off Dover on the evening of May 10th by a destroyer on patrol duty and were landed at Dover.

Mr. Stokes and Serjeant Fillmore had left Lympne during the morning on a Bristol Fighter, and had flown to an aerodrome near Ostend. They met Capt. Evans, who wished to return to England and was accordingly taken on board as a passenger. The machine left for England at about three o'clock in the afternoon. The weather was fine and all went well until the machine was within a few miles of the Kent coast, when it fell into the sea. A fishing vessel at once gave information, and a destroyer was dispatched from Dover to the spot between Littlestone and Lympne. The bodies were found floating together, but there were no signs of the machine. It was stated that the accident was due to engine trouble.

At the inquest held at Dover on May 12th a verdict of "Death from Immersion" was returned. It was stated in evidence that Mr. Stokes and Serjt. Fillmore flew the machine to France on May 9th, and that the Serjeant piloted the machine on the homeward journey. Although the machine was only a two-seater, and it was against orders to do so, Mr. Stokes and Capt. Evans travelled back with Serjt. Fillmore. They left the French Aerodrome at 3 o'clock, but failed to reach Lympne. Some fishermen saw the bodies floating the next morning, but would have nothing to do with them, owing, it is thought, to superstition. Eventually Dover patrol destroyers and aeroplanes went in search and recovered the bodies. Watches on the bodies had all stopped at 3.40. The aviators were wearing the regulation lifebelt.

GARDNER.—In an accident near Leuchars, Fife, Lieut. David Gardner, R.A.F., was killed. The machine got into a spin and was wrecked. Mr. Gardner was an experienced aviator.

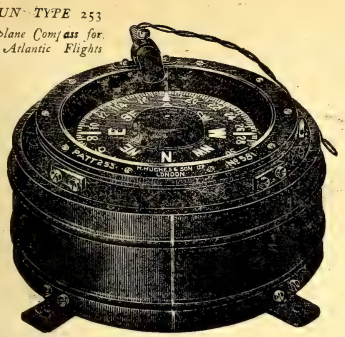
HARRISON.—Sec. Lieut. Cuthbert Harrison, R.A.F., was killed recently while learning to fly at Gosport. He was following another aeroplane piloted by an instructor, when his machine fell on the railway line between Fareham and Gosport. The petrol tank exploded.

KNOTT.—An inquest was held on May 7th at Kenley on Capt E. N. Knott, A.F.C., R.A.F., aged 20, of Sutton Coldfield, who



Will anyone recognising one or more of the above group, kindly communicate with Mrs. George Morton, 34, Earl Street, Toronto, giving information as to the identity of the Officers and their squadron and the place where the photograph was taken?

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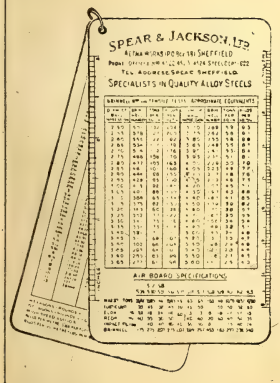
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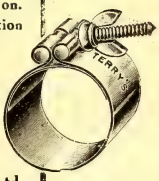
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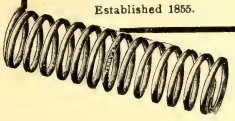
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was killed on May 3rd when starting for Paris accompanied by Major-General Sir F. H. Sykes, C.M.G., D.S.O., the Controller-General of Civil Aviation.

Lieut. A. W. Edwards, R.A.F., of the Paris Communication Squadron, who saw the machine leave, said he noticed the engine slowing down as the pilot took a climbing right-hand turn. When the machine was only about 30 feet in the air the engine stopped, and the machine then nose-dived and side-slipped to the ground. He attributed the accident entirely to engine failure.

The Coroner, Mr. F. J. Nightingale, in the absence of a jury, certified that death was accidental.

PARRY.—Flight Serjeant Parry, R.A.F., was killed near the Alexandra Park Aerodrome, Manchester, on May 3rd. He was testing a machine in preparation for a flight to France, and when about 200 ft. up it nose-dived and fell, and burst into flames. Rescuers rushed to the scene, but some minutes elapsed before the unfortunate pilot was extricated. He was badly burned, and died shortly afterwards. The machine was reduced to wreckage in a few minutes.

STACE.—Mr. A. H. B. Stace, R.A.F., who was killed while flying in France, on May 3rd, was the only son of Mr. and Mrs. H. P. Stace, of Brackley, Northants. He was 20 years of age.

TAYLOR.—Corporal Charles William Chamberlain Taylor, R.A.F., aged 18, of 78 Squadron, was recently killed at the Hornchurch Aerodrome, near Romford, by the accidental discharge of a rifle.

Cpl. Taylor, a second air mechanic named Bragg, and another non-commissioned officer were in the guard-room when Bragg picked up a rifle and began to examine it. Knowing that the weapon was loaded, the other non-commissioned officer told him to be careful; but Bragg replied that there was no danger, as the safety catch was on.

Whether the man was mistaken, or he accidentally released the catch is not known; but while he was handling the rifle it was discharged. Cpl. Taylor was shot in the back and died as he was being removed to the New Zealand convalescent camp at Grey Towers. Bragg was placed under arrest.

Cpl. Taylor is a son of Mr. John Taylor, Sneepcot, Bartestree, Herefordshire.

WHITE.—An inquest was held at Coventry on May 8th on the body of Serjeant-Mechanic White, R.A.F., who was killed by the collapse of the right wing of the machine in which he flew from Norwich to Coventry.

The jury returned a verdict that the collapse of the right wing of the aeroplane was due to the wood being affected by over-dryness—wood which ought not to have been used in aeroplane construction. They said, further, that there was criminal negligence by some person or official who was at present screened by the Department concerned.

The Coroner said the attitude of the Department in withholding information might come before the House of Commons.

Engagements.

DAVENPORT—BOLOMEY.—The engagement is announced between Lieut. William Frost Davenport, R.A.F., son of Mr. and Mrs. W. Davenport, Telford Avenue, Streatham Hill, S.W., and Marie Louise, only child of the late Henri Louis Bolomey, of Penkridge, and Mrs. H. Davenport, Fairmount, Cannock, Staffs.

DAWES—UPTON.—The marriage arranged between Capt. Richard Wilkinson Dawes, R.A.F., and Miss Ruby G. A. Upton will take place on Tuesday, June 3rd, at St. Mary's Church, Market Drayton, at two o'clock.

OMMANNEY—CHAMBERS.—The engagement is announced between Capt. Patrick Graem Nelson Ommanney, R.A.F., younger son of Admiral Sir Nelson Ommanney, K.B.E., C.B., and Lady Ommanney, to Pansy, eldest daughter of Major W. Grahame Chambers, R.A.F.

Marriages.

BEDDOW—HOLMES SCOTT.—On May 1st, at Hampstead Parish Church, Capt. Leslie Towne Beddow, R.A.F., elder son of J. Beddow, Esq., M.R.C.S., L.R.C.P, and Mrs. Beddow, of Thorverton, near Exeter, was married to Doris Holmes Scott, D.A., W.R.A.F., widow of Capt. A. Holmes Scott, M.C., R.E., and only daughter of the late J. S. Clayton, M.D., F.R.C.S. Edin., and Mrs. Clayton, 97, Vicarage Road, Eastbourne, by the Right Rev. F. Goldsmith, D.D., Bishop of Willesden.

GAY—OLIVER.—On May 1st, at St. Matthew's, Ealing, Lieut. Bernard Clement Gay, R.A.F., only child of Mr. and Mrs. Gay, of Southampton, was married to Phyllis Grace, only child of Mr. and Mrs. E. A. Oliver, of Osborne House, The Common, Ealing.

KAUPER—HOOPER.—On May 12th, at Kingston Parish Church, Lieut. H. A. Kauper, R.A.F., was married to Beatrice, second daughter of Sub-Divisional Inspector Hooper, of the Kingston Sub-Division, Metropolitan Police, by the Rev. Basil Matthews.

SARSONS—BENT.—On May 6th, at St. Saviour's Church, Eastbourne, Capt. Arthur W. Sarsons, R.A.F., was married to Sybil Maude, daughter of J. Bent, Esq., Eastbourne, by the Rev. C. T. Bent, uncle of the bride.

TAYLOR—RATCLIFFE.—On May 7th, at St. Barnabas's Church, Clapham, Sec. Lieut. Cyril Taylor, R.A.F., was married to Dorothy Winifred Ratcliffe, by the Rev. Max Williams.

Births.

HORTON.—On May 6th, at 28, Magdalen Road, Ripon, the wife of the Rev. H. Ellis Horton, late Chaplain, R.A.F., of a daughter.

JENSEN.—On May 8th, at 1, Sutton Court, Chiswick, to Gwynifrid (née Palmer), the wife of Capt. J. Jensen, R.A.F.—a daughter.

* * *

Capt. Warman, R.A.F., and Lieut. McPherson, R.A.F., two Canadian officers, were seriously injured at Lower Edmonton, on May 8th. The officers had started from Chingford, and when over Lower Edmonton engine trouble developed, and the pilot, Mr. McPherson, tried to land. The machine collided with a gate and overturned, the occupants were pinned beneath the aeroplane, and were unconscious when found.

DEMOBILISATION OF AIRMEN.

Numerous complaints are being received from a certain class of demobilised men of the R.A.F. to the effect that their accounts have not yet been finally settled up. Probably this is due to the fact that these men have not fully appreciated the special arrangements made on their demobilisation, and to which they themselves assented in writing.

During January, 1919, there was considerable impatience on the part of the men of the force to be demobilised at the earliest possible moment, but it would have been beyond the power of any pay office to deal with the accounts of the large numbers who wished to be demobilised during the usual twenty-eight days' furlough as laid down.

It was thereupon decided that men in excess of the number that could be dealt with on the ordinary procedure would be demobilised if they so wished provided they signed an agreement under which they received before leaving their units twenty-eight days' furlough pay and ration allowance, an advance of £2 against their gratuity, and £2 12s. 6d. allowance for civilian clothing, but undertook not to ask for a final settlement of their accounts within a period of three calendar months from the date on which their twenty-eight days' furlough expired.

This system was brought into force on Jan. 28th, and a large number of men were demobilised under it during the ensuing three months. The men accepted the system voluntarily, and signed a personal statement to that effect.

As a matter of fact, these outstanding accounts are being settled well in advance of the dates specified, and, in necessitous cases, provisional advances in cash are made to applicants. Special steps also have been taken to have all outstanding cases settled with as little delay as possible. They are being dealt with in order of date, and it is expected that the latest will have been cleared early in June.

The system, having served its original purpose, has now been cancelled, and all men of the R.A.F. demobilising are being settled within the usual period of twenty-eight days.

AIRCRAFT IN AFGHANISTAN.

Concerning the use of aircraft in the Afghan rising, the "Daily Express" published on May 10th the opinion of a certain officer. The following remarks are extracted:—

"Aeroplanes will be of great service both for reconnaissance work and bombing. By this means we can ascertain the strength and whereabouts of the tribal gatherings. The improvement in modern armament has greatly increased our capacity for dealing with these risings.

"I cannot say what effect the use of aeroplanes will have on the Afghans, but if there is religion at the back of this movement they will stand a lot. Aeroplanes were very successfully employed in the Mahsud rising of 1917, which quickly collapsed."

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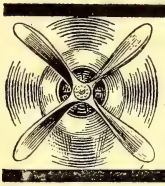
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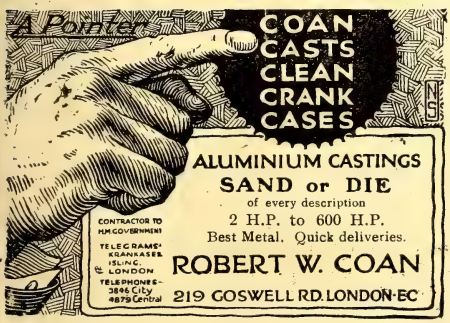


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ATHLETICS IN THE R.A.F.

In a return game at Fulham on May 5th the Overseas R.A.F. repeated their victory of last week against the R.A.F. (England), but, while they again scored six times, their opponents replied with three instead of one goal. The England team twice took the lead by the aid of Lee and Pick, Adams and Morris in turn equalising, while Fox made the score 3 all after Adams had put Overseas in front. Each goal had narrow escapes before Masterson—left quite unmarked—scored the first of three more points for Overseas, the last two being obtained when England, having lost Crook, who was injured, relied upon one back. Adams got a very good goal—his third of the match—and, from a centre by him, another was claimed by Morris. A few hundred people watched a game which was notable for the heavy scoring.

R.A.F. Boxing.

On May 14th (to-day) the R.A.F. boxing champions will do battle at the Northampton Institute in a tournament in which the best fighters in all the Services will compete.

On April 30th the R.A.F. boxers met in the gymnasium of the Cranwell Aerodrome in the presence of more than 1,000 officers and men. Brig.-Gen. F. R. Scarlett awarded the prizes. The following are the results of the finals :—

Officers.

Feather Weight.—Sec. Lieut. C. E. Hodgkinson, 3 Group, Cambridge, beat Sec. Lieut. T. Stroud, B.E.F., France.
Light.—Capt. P. W. Smith, 3 Group, Cambridge, beat Sec. Lieut. R. J. Gee, France.
Welter.—Sec. Lieut. S. J. Mason, France, beat Lieut. R. A. Y. Simpson, New Romney.
Light Heavy.—Capt. T. Roberts, France, beat Capt. B. J. Brady, Cranwell. Capt. Brady retired owing to a fractured thumb.
Middle.—Lieut. W. B. Clarke, 3 Group, Cambridge, beat Sec. Lieut. K. P. McIntee, 11 T.D.S., Old Sarum.
Heavy.—Lieut. G. H. Price, C.F.S., Upavon, beat Capt. H. Usher, Gullane.

Other Ranks.

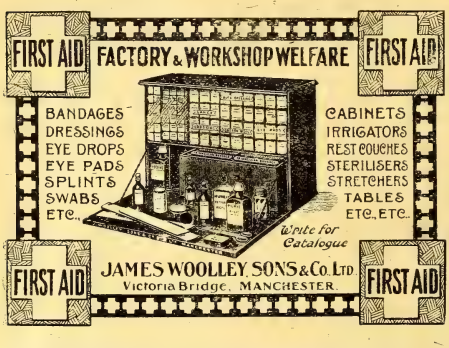
Fly Weight.—A.C. Stelfox, 7 T.D.S., Feltwell, beat A.C. Fullbrook, E. and P. Depôt, Chingford.
Bantam.—Serjt. H. Groves, France, beat A.C. J. Hannan, 9 A.A.P., Newcastle.
Feather.—A.C. S. Bennett, 167 Squadron, Bircham Newton, beat A.C. Elderton, Armament School, Uxbridge.
Light.—Serjt. Stone, France, beat A.C. Clancy, Isle of Grain.
Welter.—Serjt. Swinnerton, France, beat Corpl. Winfield, France.
Middle.—Corpl. Garratt, France, beat Serjt. Spoors, 73 Wing, Yarmouth.

Cross-Country Running.

An eight miles relay race, organised by the Southern Counties' Cross-Country Association for military units, was held at Hackbridge on May 7th.

The conditions were that four from each team had to run two miles each way. The 14th Reserve Battery, R.F.A. (Larkhill) finished first and completed the eight miles in 41 min. 23 2-5 sec. The S.A.R.D. (Farnborough) were second in 41 min. 44 4-5 sec. The best time was accomplished by Air-Mechanic Nicks, R.A.F. (Farnborough), who ran his two miles in 10 min. 1 2-5 sec.

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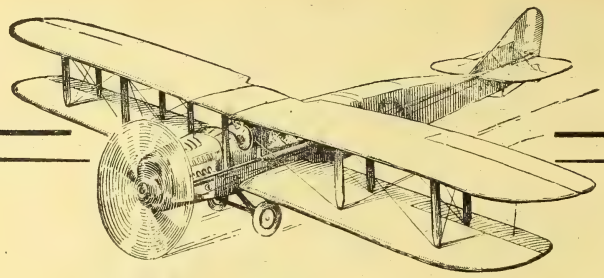
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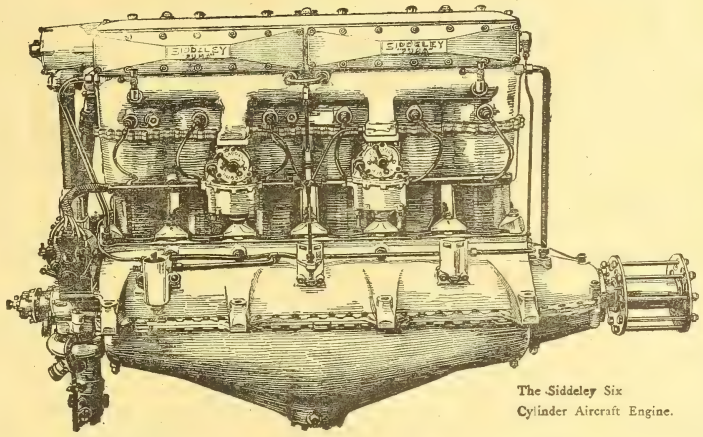
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ON THE REGULATION OF CIVIL AVIATION IN THE BRITISH ISLES.

(PART III.)

PERIODIC OVERHAUL AND EXAMINATION.

The remaining paragraphs of Schedule III of the Regulations read as follows:—

SCHEDULE III—(*continued*).

PERIODIC OVERHAUL.

5. All passenger aircraft must be inspected, overhauled and certified as airworthy by competent persons appointed by the owners or users of them, and licensed for the purpose under this schedule, at such times as the Secretary of State may direct, and such certificate or certificates must be produced to the Secretary of State on demand.

6. Aircraft inspected, overhauled or certified as provided in the foregoing paragraph may be inspected by authorised representatives of the Secretary of State, and the Secretary of State is entitled under these regulations to cancel or suspend the certificate of airworthiness of any aircraft deemed to be unsafe as a result of such inspection.

EXAMINATION BEFORE EACH FLIGHT.

7. No passenger aircraft carrying passengers shall on any day proceed on any journey unless it has previously been inspected at least once on that day by a competent person licensed for the purpose under this schedule, who shall not be the pilot of the particular machine.

8. If such competent person is satisfied that the aircraft is fit in every way for the flight or flights proposed, he shall sign in duplicate a certificate to that effect, which certificate shall be countersigned by another person in the employment of the owner, giving the time and date of such certification. For this purpose the countersignature of the pilot may be accepted.

9. One copy of each certificate will be retained by the owner of the aircraft, and the duplicate copy must be carried on the aircraft.

10. The pilot will be responsible for seeing that the aircraft, before commencing any flight, is, in his opinion, in a satisfactory condition, and does not carry more than the load specified in the certificate of airworthiness, and must sign a certificate to that effect.

In paragraph 5 one appears to be up against either loose wording in drafting the Regulations, or else against a rather peculiar piece of law. Apparently "all passenger aircraft" (besides being inspected and certified as airworthy) are to be "overhauled . . . . by competent persons appointed by the owners or users of them, and licensed for the purpose under this schedule." If the word "overhaul" means what it is generally taken to mean, this paragraph implies that every mechanic who overhauls a passenger machine must be "licensed for the purpose."

One is by no means opposed to the idea of licensed mechanics, but it is at any rate startlingly new. The examination of mechanics prior to licensing them should be an entertaining process, especially if the examiners are R.A.F. officials, full of military dignity, and if the examinees are undisciplined mechanics with Bolshevist tendencies of the kind so energetically defended by certain contributors to the current controversy in this paper on Brains (alleged) versus Discipline.

The corresponding Directions on this point are interesting, but not enlightening, as will be seen later.

None will quarrel with paragraph 6, for obviously there must be some competent authority—which means not necessarily a competent person, but merely a person invested with power—to cancel or suspend certificates issued by mere licensed inspectors.

Examination before each flight, as specified in paragraphs 7 to 10, is also a reasonable provision for the safety of the public. A passenger machine should be inspected at least once a day. But this single inspection daily is quite a relief after the idea current before the issue of the Regulations, that every machine was to be inspected after every flight.

One had visions of excited inspectors dashing out onto an aerodrome to inspect a "joy-ride" machine after each ten-minute trip with its load of half-guinea passengers, and hurrying over the job so as not to delay the departure of the next load. Or, alternatively, one imagined the very officious inspector who would insist on each machine being brought back to its shed for an examination lasting an hour, although the flight had only lasted ten minutes. Now apparently, after the machine has had its one inspection of the day, the pilot can bump it and bounce it and strain it as much as he likes, and none will bother to see whether he has buckled an undercarriage strut or cracked an axle—unless, of course, one of the "authorised representatives of the Secretary of State" (paragraph 6) comes along and interferes with him.

So far so good. We will now consider the Regulations, which read thus:—

IV.—Persons competent to undertake periodical inspection and overhaul and examination before each flight of Aircraft.

1. With reference to Regulation 2 (1) and Schedule III (3 and 5-10), the following is the procedure for any person desirous of being licensed as a competent person, hereinafter referred to as "ground engineer," to undertake the inspection of periodic overhauls of aircraft required to be certified as airworthy, or as a competent person to examine such aircraft before each flight.

2. Application for licences should be made to the Secretary, Air Ministry, London, W.C.2.

3. Application forms will be supplied on demand.

4. Subsequent to the forwarding to the Secretary, Air Ministry, of an Application Form for a Ground Engineer's Licence, the candidate will be requested to report to a local representative of the Director of Aircraft Inspection for examination. At this examination the candidate will be required to submit proof:—

(a) That he is not less than 21 years of age.

(b) That he has served at least two years as a mechanic or engineer on internal combustion engines, or a like period on aircraft construction or maintenance, or a period of not under three years on joint aero, engine and aircraft construction or maintenance.

5. A candidate may apply to be licensed as a Ground Engineer to overhaul and inspect *all* Flying Machines and/or engines after overhaul and each day before flight; or may apply for a licence limited to the inspection of *any* named type or types of Flying Machine or engine either after overhaul and/or each day before flight.

6. Candidates will be required to submit proof of knowledge:—

(a) For Engines: Of the general principles of internal com-

bustion engines applied to aircraft, including the general principles of ignition, carburation, lubrication and cooling; knowledge of the inspection, testing and adjustments necessary for the installation and functioning of the complete power unit in the aircraft; and the capacity to supervise, or inspect running repairs and/or overhaul of particular engines.

(b) For Flying Machines: The general principles of construction, rigging, trueing-up and adjustment of flying machines; a detailed knowledge of construction, adjustments, maintenance and final inspection of the flying machine's components; and the capacity to supervise, or inspect running repairs, and/or the overhaul of specified types of flying machines.

7. The examination may be in part written, and in part oral. Candidates may be required to give practical proof of knowledge.

8. Aircraft certified daily by such Licensed Ground Engineers will be periodically re-inspected by a person or persons duly authorised by the Secretary of State, who reserves the right to suspend or revoke licences granted as above, should such certified aircraft be deemed by him as a result of such examination to be unsafe.

9. Ground Engineers certifying Flying Machines or engines as airworthy after overhaul, must be in a position to certify that all the conditions required for the inspection of subsequent aircraft during construction that apply to the overhaul have been carried out. The Secretary of State reserves the right to suspend or revoke the licence of the Ground Engineer responsible for certifying that the overhaul has been correctly carried out, should a test inspection be deemed by the former to indicate that the Flying Machine is not airworthy.

10. Ground Engineers' licences will be issued at a charge of 5s., and will be valid for a period of 12 months, and will then be subject to renewal. The Secretary of State reserves the right to re-examine the candidate for renewal, if considered necessary.

11. In the event of any applicant being required to undergo a practical examination, a further fee of one guinea will be charged.

12. Certificate No.....

PILOT'S CERTIFICATE OF GENERAL FITNESS OF AIRCRAFT BEFORE FLIGHT.

Flying Machine Type.....Registration No.....
Preparatory to Flight from.....on.....Time to .....

LOADING.

Total weight of the Aircraft including all items of load does not exceed.....lbs.

Loading (including placing of passengers) such that the centre of gravity of the Aircraft is within the specified limits.....
Petrol, Oil and Water sufficient for proposed journey.....

OFFICERS AND CREW.

NAME.	DUTY.	LICENCE NO.
.....		
.....		
.....		

Number of passengers.....
This Aircraft is *considered fit* in every way for the proposed journey.

Signed.....
Date.....

13. Certificate No.....

DAILY CERTIFICATE OF SAFETY OF AIRCRAFT.

Flying Machine Type.....Registered No.....
Inspection at .....on.....time.....

I hereby certify that I have this day examined the above Flying Machine and that I consider it safe in every way for flights today when loaded as specified in the Certificate of Airworthiness.

Signed ..... (Ground Engineer).
Date.....

I hereby certify that I have this day examined the engines, engine installations and accessories of the above Flying Machine, and that in my opinion they are in every way safe for fligh s today.

Signed..... (Ground Engineer).
Countersigned.....
Date.....

NOTE.—Both certificates may be signed by the same individual if licensed for both Flying Machines and Engines.

COMPETENT PERSONS.

Please note, for a start, that a person "licensed as a competent person" or "ground engineer" differs from a "competent authority" in that the former must evidently possess knowledge, or at any rate experience, whereas the latter need only possess authority. And be it noted also that, though the Directions give a good deal of useful information about how to acquire certificates of competence, they leave one very much in a fog as to that matter of overhaul to which one has already referred.

For example, paragraph 1 distinctly refers to ground engineers as being licensed to undertake the "inspection of periodic overhauls." But paragraph 5 says clearly that a candidate may apply to be licensed "to overhaul . . . all Flying Machines and/or engines after overhaul." Perhaps the Air Ministry will be so good as to explain when, why, where, and how a Flying Machine and/or engine is to be overhauled after overhaul.

It seems to be something of a work of supererogation, rather like digging up seeds to see whether they are growing properly. That is if the word overhaul means in the Air Ministry what it means in an engineering shop. But perhaps it does not.

In an engineering shop an overhaul means taking a machine to pieces, scrapping all the dud parts, putting in new stuff, and making it as good as or better than new. From time to time one has heard that the staff at the Air Ministry or of the Technical Department, Air Group, Ministry of Munitions, was being thoroughly overhauled. In those cases it has generally meant promoting the duds to still higher authority, turning out a few really good people, bringing in a lot more incompetents, making the whole of the machinery more cumbersome, and generally producing a worse state of affairs than existed before.

So perhaps overhauling a machine after overhaul may appear necessary to those familiar with the habits of the Ministries of Air and Munitions, but unfamiliar with workshop practice. However, things at the Air Ministry itself are changing, for General Trenchard is back at work, and seems to be conducting an overhaul (according to workshop practice) of the last overhaul (according to Air Ministry practice), so perhaps this may be a happy augury for future overhauls of and by Air Ministry officials. Nevertheless it would be well to have an explanation of this curious paragraph 5.

LIMITED LICENCES.

The idea of dividing the licences of Ground Engineers into two classes—*id est*, those for *all types* of machines and/or engines, and those limited to specified types—seems quite sound. The number of men who are competent to inspect all types must be extremely small, whereas there must be a sufficient number who are specialists on certain types. Personally one would much rather trust oneself in a machine which had been inspected by a man who was a specialist on that type than in one certified by one of those glib-tongued Jacks-of-all-Trades who make up in self-confidence for what they lack in genuine knowledge.

Every machine and every engine has its own curious little tricks, and it takes a man a long time to learn all the tricks of any one make. One saw the truth of this statement often enough during the war, when engine mechanics who could get the last ounce of power out of one make of engine and keep it running for weeks without overhaul (according to workshop practice) proved to be utter failures when turned onto a new type.

AN ENGINE STORY.

More or less apropos which there is a very amusing yarn told by one of our cleverest engine designers. It seems that certain of his engines were in use at a certain R.A.F. station, which must be nameless, not because there is a war still in progress theoretically, but because any indication of its whereabouts, or even as to whether it was concerned with seaplanes or land machines, might bring a crop of libel actions from the C.O., the engineer officer, all the pilots, and all the engine mechanics.

The only people who are not libelled by the story are the observers, the mess servants, the station cook, and the local W.R.A.Fs.

According to the story, the station had done no flying for weeks, and when the Air Ministry gently enquired why, the station replied that they could not get the proper revs. (*Anglicé*, revolutions per minute) out of their engines, which in proper official language the station damned in heaps. Therefore the Air Ministry wrote to the makers of the engines and said, "What about it?" or words to that effect.

The engine-makers therefore sent one of their ground engineer specialists down to the station to investigate. When he arrived, the machines were all pulled out of the sheds tail first, the engines were started up, and, sure enough, they all failed to give the revs. which were considered necessary before the machines could be passed as fit to fly.

The firm's engineer, instead of starting juggling with carburetter jets, magneto timing, and such things, just turned up his nose, sniffed at the wind a bit, looked at the scenery, and then asked, "Do you always test your engines in this position?" He was assured that they did, because, as they explained to him, if the machines were turned round, the blast from the air-screws would blow into the sheds and kick up a dust, and possibly blow the backs out of the sheds.

With the utmost civility, and rather with the apologetic air of one who was asking a superior person to humour a little personal foible, he suggested that a machine should be turned round with its tail to the shed, and that the engine should then be tried again. Very kindly the authorities of the station gave way to him. A machine was turned round, the engine was started—and the needle of the revolution indicator proceeded to run right off the map.

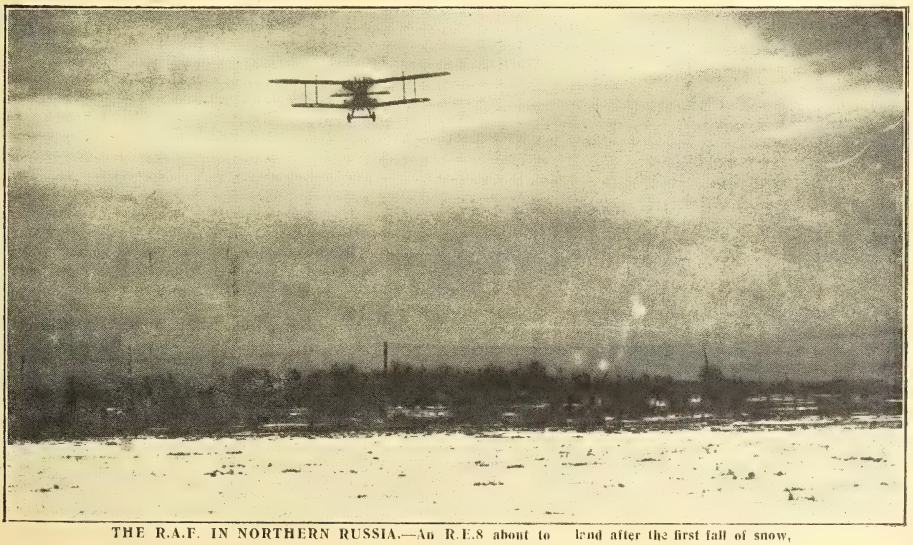
Then the mere ground engineer humbly pointed out that in that particular locality the wind blew permanently and strongly in one direction—one must not say which, for fear of the law of libel. And that direction happened to be straight into the face of the sheds. Consequently, so long as the machines stood with their tails to the wind, the engines were being asked to supply power for the airscrews to push a thirty-mile-an-hour wind backwards before they really began to get their revolutions at all. When the machines were turned head-to-wind the wind then helped the screws to turn, and so the engines gave more revs. than were necessary.

After which—according to the story—the station retired into corners and kicked itself *privatim et seriatim*. Then it went out and flew like a lot of little dickie-birds. And the Air Ministry was very pleased with it.

This is really a very difficult story to tell, because if one expresses belief in it one is libelling most of the people on the station, and if one expresses disbelief one is libelling the engine-maker. One can only hope that neither the personnel of the station nor the engine-maker will fancy that they recognise themselves and proceed to fit the cap on their own heads in order to vindicate their service or professional honour. For the story ought to be told in the interests of Civil Aviation, because it shows that the Ground Engineer "limited to the inspection of *any* named type or types of . . . engine" (*vide* paragraph 5) ought to have a fair amount of common gumption as well as being an "expert" in his own line of business.

Examinations.

The subject-matter for the proposed examinations offers much opportunity for comment, but one will refrain, pending the institution of the actual examinations. When one hears a bit more about the way in which these examinations are conducted, and by whom, one may have more to say on the subject. It is to be hoped in any case that they will be done better than were certain R.N.A.S. examinations for the promotion of ratings, when one of the cleverest riggers of the most modern scouts was ploughed for promotion to Petty Officer because he could not tell his examiner off-hand the proper angle of incidence of a "long-horn" Maurice Farman, a type of machine which he had never seen, because it was obsolete before he even joined the Service,



THE R.A.F. IN NORTHERN RUSSIA.—An R.E.8 about to land after the first fall of snow.

and a type which appeared to be the only machine that the examining officer knew.

It is of interest to note that the examination "may be in part written and in part oral" (*vide* paragraph 7). Some of the best all-round mechanics concerned with aviation, men of the very type most desirable as ground engineer inspectors of passenger aircraft, can do very little more than sign their names. At any rate they could certainly not write the answers to an examination paper.

The last man one wants on this job is the examination wallah, or the over-educated, long-haired, long-tied, long-coated, and long-tongued Bolshevik from a suburban polytechnic, who is just the kind of thing who would pass with flying colours a written examination of the kind indicated in paragraph 6, sub-paragraphs (*a*) and (*b*). He would probably answer all the questions in the examination and miss seeing all the defects in the aeroplanes.

The only proper sort of examination which is worth a hang for a job of this sort is one that is purely practical, something like the "trade" examinations which used to be run for would-be R.N.A.S. mechanics at the Crystal Palace, when Lieut.-Commander Markham, R.N.V.R., was in charge of affairs there.

The Certificates.

There seems little to which anybody can object in the specimen certificates shown in paragraphs 12 and 13. They throw a great deal of responsibility on the pilots and on the ground engineers, but this is all to the good, for the greater the responsibility the better will be the class of man who will take such responsibility.

Presumably if a man is running a little commercial aviation show of his own there is nothing to prevent him from being his own pilot, ground-engineer (flying machine), and ground engineer (engines), provided that he can pass all the required examinations. If he can do so he must be a very good all-round man, and so he deserves to be encouraged.

Marks on Aircraft.

From the vexed question of "competent persons," always one which is very difficult in a world composed of people the great majority of whom are quite wonderfully incompetent, the Regulations pass on to the comparatively simple matter of "Registration of Nationality Marks," which are labelled Schedule IV.

The Regulations on this subject read as follows :—

SCHEDULE IV.

Registration and Nationality Marks.

1. The registration and nationality marks shall be such as the Secretary of State may direct.

2. The registration and nationality marks should be affixed in black on a white ground in the following manner, and underlined with a black line :—

(*a*) Flying Machines.—The marks shall be painted once on the lower surface of the lower main planes, and once on the upper surface of the top main planes, the top of the letters to be towards the leading edge. They shall also be painted along each side of the fuselage between the main planes and the tail planes. In cases where the machine is not provided with a fuselage the marks shall be painted on the nacelle.

(*b*) Airships and Balloons.—In the case of airships the marks shall be painted near the maximum cross section on both sides and on the upper surface equidistant from the letters on the sides. In the case of balloons two marks shall be painted on the maximum horizontal circumference as far as possible from one another. In the case of airships the side marks shall be visible both from the sides and ground.

3. The nationality mark in the case of flying machines and airships shall also be painted on the port and starboard sides of the lower surface of the lowest tail planes or elevators and also on the upper surface of the top tail planes or elevators, whichever is the larger. It shall also be painted on both sides of the rudder, or on the outer sides of the outer rudders if more than one rudder is fitted.

In the case of balloons the nationality mark shall be painted on the basket.

4. In the case of flying machines the height of marks on the main planes and tail planes respectively shall be equal to four-fifths of the chord, and in the case of the rudder shall be as large as possible. The height of the marks on the fuselage or nacelle shall be equal to four-fifths of the depth of the narrowest part of that portion of the fuselage or nacelle on which the marks are painted.

In the case of airships the nationality mark painted on the tail plane shall be equal in height to four-fifths of the chord of the tail plane, and in the case of the rudder shall be as large as possible. The height of the other marks shall be equal to at least one-twelfth of the circumference at the maximum transverse cross-section of the airship.

In the case of balloons the height of the nationality mark shall be equal to four-fifths of the height of the basket, and the height of the other marks shall be equal to at least one-twelfth of the circumference of the balloon.

In the case of all aircraft the letters of the nationality and registration marks need not exceed eight feet in height.

5. The width of the numbers or letters shall be two-thirds of their height, and the thickness shall be one-sixth of their height. The numbers or letters shall be painted in plain block type and shall be uniform in shape and size. A space equal to half the width of the numbers or letters shall be left between each number or letter.

6. In the case of underlined letters the thickness of the lines shall be equal to the thickness of the letter. The space between the bottom of the letters and the line shall be equal to the thickness of the line.

7. Where the registration and nationality marks appear together a hyphen of a length equal to that of one of the numbers or letters shall be painted between the nationality mark and registration mark.

8. The registration and nationality marks shall be displayed to the best possible advantage, taking into consideration the constructional features of the aircraft. The marks must be kept clean and visible.

There are no Directions corresponding to these Regulations presumably because the Regulations are sufficiently explicit in themselves.

Much as one may dislike disfiguring a handsome machine by painting it all over with huge figures, it has been proved by the misbehaviour of young cads in the R.A.F. that such identification of aeroplanes is necessary and that marks as specified are the only kind which are of any use.

There was a howl from motorists about disfiguring their cars when car-numbers were first instituted, but now nobody worries about them, because our eyes are accustomed to the disfigurement. When all the regulations concerning numbers and nationality marks have been fulfilled the average aeroplane will look something like a dazzle-painted ship.

Incidentally, it would be interesting to try a few experiments as to how far a perfectly legal number on an aeroplane may be camouflaged by skilful dazzle-painting. One will see what some of one's artistic friends can do in the matter.

The hand of the comic policeman is seen in the old proviso that "the marks must be kept clean and visible." A glance at the under side of the lower plane of certain machines with rotary engines will elucidate the why and wherefore of this sting in the tail of Schedule IV. On the whole the aeroplane-owner might have been worse treated.

The Next Instalment.

The next instalment of the Regulations (Schedule V) deals with the interesting subject of Log Books, and Schedule VI with Prohibited Areas, also a matter for debate, so they had better be kept over till next week.

C. G. G.

(To be continued.)

Now that civilian flying is permitted

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THE ATLANTIC ATTEMPTS AND THE AUSTRALIAN COMPETITION.

Technically the Atlantic Ocean remains uncrossed by air, but a number of very gallant aviators—to wit, Commander John Towers, U.S.N., and the crews of the American N.C. boats—have proved that, given favourable conditions, the crossing can be made. Which is just as much as everybody knew before, provided they knew anything of the history of aviation. And the pre-war German record of 24 hours 12 minutes remains, apparently, unbeaten.

Lord Northcliffe and his papers have had a goodly instalment of the advertisement which was presumably the object in offering the prize. And Civil Aviation has had about the worst possible advertisement, for now the ordinary reactionary person is confirmed in his or her belief that commercial aviation is what is vulgarly termed a "wash-out."

With all acknowledgment of the personal heroism of those aviators who made the attempt to fly across, one is compelled in plain honesty to say that it would have been better for the progress of aeronautics if their attempts had never been made. As heroes they are comparable with those who have tried to reach the Poles and have died in or survived the effort. And the practical use of success or failure in either competition is just about equal, at any rate to-day.

If the energy and care and ingenuity and hard work which have been wasted and are being wasted on trans-Atlantic attempts had been devoted to organising flying-boat services along the great rivers of the world, or to organising aeroplane services over the undeveloped plains of the world, we should by now be in a fair way towards capturing the world's aircraft business, and at the same time public belief in the usefulness of aircraft would be increased. As it is, thousands of pounds are being wasted and nobody is a ha'p'orth the better, except the Advertisement Department of the Northcliffe Press.

The Business Proposition.

Does anybody seriously believe that if Mr. Hawker had succeeded in reaching Ireland, or Brooklands, the Sopwith firm would have sold as many more aeroplanes as they would have sold if they had spent the same money in sending a well-equipped commercial mission to the Argentine or to China? M. Blériot flew the Channel in 1909. Does anybody buy Blériot machines to-day because he did so? In fact, is there such a thing as a Elériot machine to buy? If so, one is ignorant of its appearance.

Some day there will be a regular aerial service across the Atlantic, but it will not come because of the *Daily Mail* prize, nor through continual attempts to fly across the Atlantic. After M. Blériot staggered across the Channel and crashed at Dover with his engine's last splutter, and after M. Hubert Latham fell almost in Dover Harbour, people did not develop aeroplanes by keeping on trying to fly the Channel. They went on developing them over land. And, when over-land flying had proved that the odds were in favour of any decent aeroplane getting across the Channel, then and not till then did cross-Channel flying become a habit.

But even now aeroplanes fall into the Channel and drown their crews, as has happened too frequently of late. How much more ridiculous is it, therefore, to talk about regular trans-Atlantic services developing from the success of one heroic effort to be first across? M. Blériot's flight had at least the value of demonstrating for all to see that Great Britain was no longer an island. A flight across the Atlantic, if it succeeds, proves nothing that is not common knowledge already. If it fails it merely provides material for those who still scoff at the practical utility of aircraft.

The British Navy.

One is moved by certain questions in the House of Commons on Monday last—which questions will be found in their appropriate place on page 2078—to refer to the inactions of their Lordships of the Admiralty in this matter. The American Navy helped their aviators by spreading a chain of vessels along their route, so that the risk of life was reduced to the utmost. The British Navy pursued a course of masterly inactivity.

Such inactivity certainly cannot be attributed to lack of sportsmanship in the Navy itself, nor to fatigue owing to its activity during the war. Therefore the Admiralty itself is solely to blame for neglecting to equal the American proceedings. Nevertheless one cannot help recalling the story of the two soldiers who became a trifle bored with a bluejacket who had been holding forth in a public place on what the Navy had done. One turned to the other and asked, "Bill, wot did the Nivy do in the Great War?" Whereupon the other, with his nose inside his mug, replied scornfully, "The British Nivy drahned Lord Kitchener!"

One confesses to something of the same feeling towards their Lordships in this matter of what might have been done for the trans-Atlantic aviators and what was not done. For one cannot doubt that if either Mr. Hawker or Mr. Raynham had succeeded in his effort the Navy would have appropriated a goodly share of the credit by way of the navigating officer who accompanied him.

The Australian Contrast.

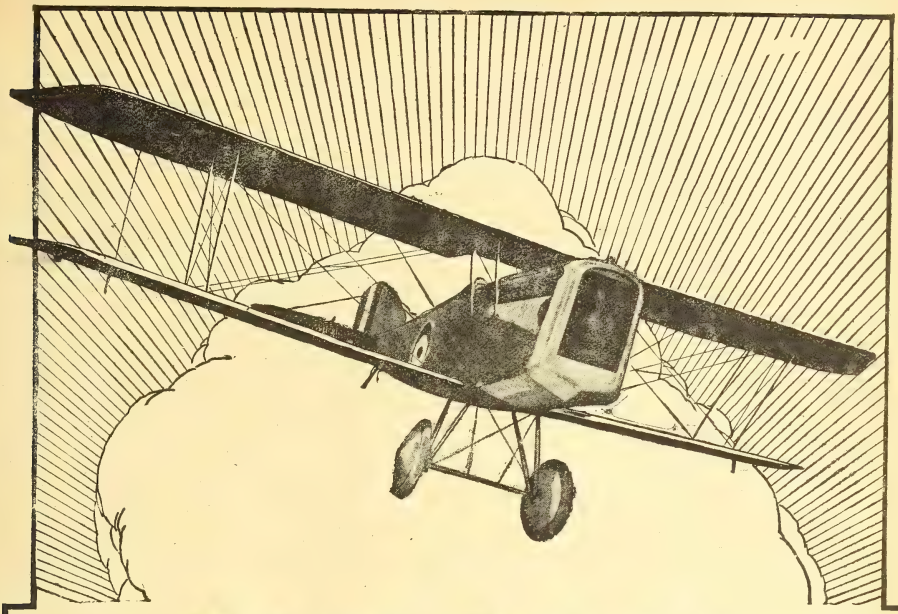
Far more sensible than the Atlantic journey is the projected flight to Australia, for here we have merely the pioneering of a useful working air route which can be made of immediate service. It involves no needless risk, in that no stage of the flight calls for greater endurance than has been customary for pilots and their engines in the past two years.

One is glad to learn that the Royal Aero Club is now doing everything possible to assist the flight, and that such delays as have occurred are due to correspondence—necessary or unnecessary—between the Government of Australia and its representatives in Europe. It seems that this correspondence is being conducted by cable, and may be actually completed by this date, so that those competitors who are ready to start may get away in the next day or two.

At present one is under a pledge of secrecy as to the first competitor who is ready to start, as he desires to remain anonymous until he is actually well on his journey—a very fit and proper view of the matter and one worthy of all respect. One can merely say that he is an ex-officer of the R.N.A.S. who has a very fine active-service record.

Whether the first attempt to win the Australian prize is successful or not, the air line to Australia should be open for mails within the next six months, and when it opens it will fill a very useful purpose, in that it should carry mails to Australia in a week, as against a month by the best boats. There is no hope of a trans-Atlantic air-mail line being run regularly for some years to come, and even then it can only come if some great improvement is made in engines, or if some epoch-making invention comes to light which will revolutionise flying as the pneumatic tyre revolutionised road transport.

Therefore one states definitely the opinion—which, though personal, is shared by many experienced persons—that the trans-Atlantic attempts, though entirely heroic sporting efforts, are quite useless so far as the progress of aviation is concerned, whereas the flight to Australia is a sound business proposition which will be of immediate value to all concerned with flying, even though a few gallant men may lose their lives in blazing the trail for the regular civil air service. Meantime one wishes good luck to those who are to attempt to reach Australia by air.—C. G. G.



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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

A Royal Visitor.

King Albert, after a conference with the Belgian Premier, flew to England on May 15th. He arrived at Hawkinge Aerodrome, near Folkestone, at 4 p.m. and took tea at the officers' mess.

On May 16th two F.2A. machines (Rolls-Royce "Eagle" Mark VIII 350 h.p. engines), one carrying King Albert, left Folkestone for Dartmouth, Devonshire, King Albert's intention being to visit his son at the Royal Naval College. Both machines descended at Gosport for luncheon and proceeded later for Dartmouth, where they were expected at 3 30 p.m.

At 6.30 p.m., one machine came into the harbour carrying King Albert, Colonel Bigsworth, Capt. O'Brien, Lieut. Woolley, and a Belgian aide-de-camp. King Albert's son and Lieut Hamilton were waiting in the Naval College launch and the King went to the college, where he was welcomed by Capt. Leatham.

The late arrival was due to engine trouble in King Albert's machine six miles from Dartmouth, which made it necessary for the machine to descend. H.M.S. "Sturgeon" and the other flying boat went to the spot, and King Albert was transferred from the disabled flying boat to the other at sea and continued his journey.

The Prince Albert's Flight.

On May 15th, Capt. H.R.H. the Prince Albert K.G., R.A.F., flew over London on a D.H.9 biplane with Lieut. King, R.A.F., as pilot. The course followed was that of the Thames to Dartford where a turn was made round the Joyce Green Aerodrome. The machine then returned to its aerodrome.

The Advance of Civil Aeronautics.

The following appeared in the "Daily Mirror" last week:—

"No ball seems complete nowadays without its ration of toy balloons. The Venice Ball was no exception, and at one time I saw Brigadier-General Seely amusing himself with quite a number of them. Apparently it was not for nothing that he went to the Air Ministry."

One believes that quite a number of other highly-placed officers at the Air Ministry learned enough about practical aeronautics during the war to enable them to take part in these sports.

An Insult.

A correspondent of the "Daily Express" writes:—"The newest Alpine sport is mountaineering in monoplanes. Lieuts. Säder and Brunner, of the Swiss Army, starting from Thun, skimmed the summits of the Jungfrau and Matterhorn, and also other minor peaks yesterday" (May 14th).

It is a nasty one for the Matterhorn to find itself classed with minor peaks, and the Jungfrau, in spite of her name, has reached maturity.

The phrase "mountaineering by monoplanes" makes one wonder how the writer would have obtained his alliterative effect if a biplane had been used—one suggests "Bernese Oberland beaten by biplane."

The Failure of Science.

According to a U.S. wireless message "Eddie Stinson, while flying 700 ft. high at a speed of 70 miles per hour, dropped a crate of eggs without smashing any. The eggs were tossed over to test a new style of parachute."

The old housewife's method of cracking eggs on the side of a pudding basin seems to be the most effective after all.

One Hopes there will be no Jonahs.

The "Daily Mail" on May 15th rhapsodised over the new Tarrant triplane described in THE AEROPLANE of May 7th. The writer of the article was greatly impressed by the accommodation provided by the "body of the machine," which "is like a whale in length and girth, with a great blunt-ended nose." He writes:—

"The pilots will sit side by side in comfortable chairs, with a splendid view all round. The engineer will stand behind in his engine room. If passengers are carried, they can stroll, if they like, down the inside of the body."

The "Mail" should have explained why the pilots should sit, the engineer stand, and the passengers be instigated to stroll.

The public may be disappointed to hear that the engineer does not keep the six 500-h.p. Napier "Lion" engines in his "engine room" so that during their strolls inside the body of the whale they will not be able (as a member of the lay Press once put it) "to watch the pistons going up and down."

A Delicate Compliment.

An enterprising firm is advertising in a feminine paper the "Adastra" flying suit for women.—No charge is made for this advertisement. The suit is a combination garment somewhat of the Lidcot type, and a note is appended to the description to the effect that it may be worn with the Adastra skirt. Immediately below this appears the further statement that these garments will be worn by the Handley Page crew on their trans-Atlantic flight. This announcement appeared almost incredible to the present writer till a soldier-man made the brilliant suggestion that as Rear-Admiral Mark Kerr, R.N., the senior member of the Handley Page crew, had commanded the Greek Navy perhaps this was a delicate compliment to the national costume of our gallant Allies.

A Windfall.

The Rumanian Bureau at Berne reports that an aeroplane worth its weight in gold was captured recently at Zalan, in Transylvania, by Rumanian troops.

The aeroplane was bound from Moscow to Budapest, under the command of one Russian and one Austrian officer, and fell into the Rumanian lines because its engines stopped.

The machine was found to be full of Russian and Austrian gold and banknotes, and Bolshevist pamphlets in several languages. The officers were arrested, and the contents of the aeroplane confiscated.

There must have been a great many (depreciated) banknotes on board if the machine was "worth its weight in gold." Of course, the Bolshevist pamphlets may have been priceless, but they would hardly be negotiable even though the author had shown himself possessed of the genius to make a fool (or a knave) of himself in several languages.

A Quotation.

The "Daily Mail," announcing the closing at the end of May of the exhibition of "War in the Air" photographs at the Grafton Galleries, makes the following remarks:—

"When the airman looks down all sorts of riddles are made clear. The tactics of infantry become transparent. But it is when the airman is depicting his own kind of war, in which 'millions of fierce encountering angels fight,' that he produces the most thrilling photographs."

The number of flying officers employed during the war is gradually being revealed to us.

Hotel-keeping Extraordinary.

One learns with considerable interest that the Aeronautical Inspection Department has now taken over a suite of offices in the Grand Central Hotel, Belfast. Just why it should do so is not particularly clear seeing that Ireland is not to any extent an aircraft producing country. True, Harland and Wolff's, of Belfast, have been doing some excellent aircraft work, and quantities of aircraft accessories have been turned out by various engineering firms, large and small, but practically all the minor firms are returning to their ordinary occupations, and the A.I.D. must find most of its occupation gone. That being so, presumably there is the greater need for palatial offices in which unemployed A.I.D. officials may spend their time while waiting for six days in the week to draw their pay at the end of the sixth day.

The legend in Belfast is that the Grand Central Hotel was taken over by the Government by mistake thusly: A Government official went to Belfast from Bristol and received a telegram sent to him to Bristol and forwarded to Belfast, instructing him to take over the Grand Central Hotel, so he took over the Belfast Hotel when he was intended to take over the Bristol Hotel. At the time there was no Government Department to occupy it, so, the contents having been dispersed, the hotel did nothing for many weeks, although accommodation was badly needed by the inhabitants of the surrounding country. Later it became a kind of headquarters for W.A.A.C.'s, then it suffered a fevered occupancy as the headquarters of a frantic recruiting campaign instituted in the hope of staving off the conscription of Sinn Feiners. This campaign was stopped by the Armistice, but still the hotel was not demobilised, and it now appears to be the home of all sorts of odds and ends of nondescript departments and seemingly is populated by Government officials who have nothing to do, including the A.I.D., as previously stated. And Belfast wants to know why the Government is keeping the hotel instead of the usual licensed hotel-keeper


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The WORLD of AERONAUTICS (continued)

The Licensing of "Personnel."

For the following one is indebted to a valued correspondent:—

"A pilot was exhibiting his prowess in the air for the edification of the proprietors of an Aircraft firm who were considering his application for a post as tester. His skill would have been patent to an equipment officer. Pilots with thousands of hours in their log-books looked on through blinding tears of admiration. Mechanics gasped with amazement at his daring. Newspaper reporters broke pencil point after pencil point in their efforts to describe his whirling manœuvres. Women screamed as he missed manslaughter by millimetres. The birds in the green trees became invisible through envy. The cows in the fields and the man from the Air Ministry gaped. The machine looped round a bridge, rolled through a hangar, flew on its back under a telegraph-wire and landed on a tarmac on one wheel.

Everybody breathed again except the Man from the Air Ministry, who smiled wisely. When the pilot asked for the verdict, he was refused the job. And when he asked why, the Man from the Air Ministry told him. His muscle balance was not commensurated with his refraction, and he had more than two dioptres of latent Hypermetropia.

E. L.

A Double Parachute Experiment.

On May 16th "Professor" W. Newell made a parachute descent at Cricklewood from a Handley Page Rolls-Royce machine. With a "Guardian Angel" parachute he jumped from the machine at a height of 2,000 feet, and after descending for about 500 feet dropped from this parachute with another one which landed him safely.

The performance may have been merely a stunt, but it seems to demonstrate the uses of pilot parachutes.

A New Parachute.

On May 9th Lieut. Emersen, an American officer, made a trial drop with a new type parachute over the sea of the Port of Anzio. Mr. Emersen, it is stated by Reuter, was provided with a collapsible pneumatic boat, into which he got after alighting on the water.

The Great Britain to Australia Competition.

The conditions of the competition for the flight from Great Britain to Australia are now officially announced as follows:—

A prize of £10,000 is to be awarded by the Federal Government to the first pilot of Australian nationality arriving from Great Britain before midnight on December 31st, 1920, within 720 consecutive hours from the time of starting, on an all-British aeroplane or seaplane.

The conditions also stipulate that all competitors must hand to the Royal Aero Club in London a week before the start an entrance fee of £100, which will be devoted to the Aero Club's expenses in conducting the competition, but any unexpended balance will be refunded to the competitors.

An L.A.D.A. Gathering.

Anything which will hold together in years to come those who have served the King during the present war is greatly to be desired, and none is more so than are the co-operative organisations of various Forces and units which have been formed for specific duties. Among these one of the most important is the L.A.D.A. Dinner Club, which held its first annual dinner on May 19th, the first anniversary of the day on which it finally defeated the Hun's aerial invaders. L.A.D.A., one may explain for the benefit of the uninitiated, stands for London Air Defence Area. As the dinner was purely a Service affair, naturally it cannot be reported as if it were a public event, but it is in the interests of the R.A.F. that a note should be made of its occurrence, and it is hoped that those members of the R.A.F. who served in the Sixth Brigade will join the Club in time for future re-unions.

Happily, Major.-Gen. Ashmore, C.B., C.M.G., M.V.O., who commanded L.A.D.A. from its formation, and who in this matter may be justly called "the organiser of victory," was able to take the chair. The way in which he was greeted by the mingled crowd of Sappers, Gunners, and R.A.F. officers (including the Sinn Feiners) representing the three corps which manned L.A.D.A., left no doubt as to the esteem in which they hold their G.O.C. General Ashmore referred to the early history of Air Defence, and to the primitive methods of early anti-aircraft gunnery—which, as he remarked, Mr. Churchill called "self-bombardment." He recalled the formation of L.A.D.A. and expressed his appreciation of the fine work done by the Gunners, by the Sappers with their search-lights and by the R.A.F. with their kite-balloon aprons and aeroplanes. The moral effect of the said aprons was evidently great, both on the Hun's and on our own people at home.

General Ashmore laid particular emphasis on the fact that as London is the finest aerial target in the world, and the most easily found Air Defence must of necessity be a permanent institution. He said that just as the Navy had in the past protected this country from invasion, so our Air Defences would in future be our chief protection. We had evolved the most efficient science of aerial defence of any nation in the world, and yet that science was only in its infancy, so we must go on developing it.

Captain Stansfield, R.N., spoke for the early R.N.V.R. Air Defence Force, Lieut.-Col. T. C. R. Higgins, Lieut.-Col. Roxby, Lieut.-Col. Christie, and Major Baker for the R.A.F. (or, rather, the R.F.C.), Col. Lucas for the Gunners, Lieut.Col. de Putron for G.H.Q., G.B., and Major Whittaker for General Staff. Major Fooks, L.A.D.A. Staff, Secretary and Treasurer of the L.A.D.A. Dinner Club, made a touching appeal for support, and one hopes that all those who were present have now been duly touched for the amounts due.—C. G. G.

Flying in Peru and Bolivia.

Those who are interested in commercial flying as such should make a note of the fact that on May 28th Squadron Commander Dyott, late R.N.A.S., will deliver a lecture to the Royal Aeronautical Society on "Flying in South America."

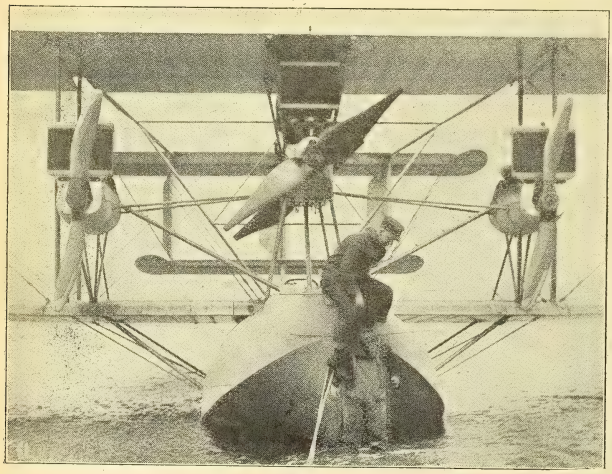
Commander Dyott recently made an extended tour in Peru, Brazil and Bolivia, crossing the Andes a number of times and penetrating into the hitherto unexplored country of the Upper Amazon. In the course of his travels he took a number of photographs and films, and he intends to show these as illustrating the conditions which prevail in that part of the country.

If one considered the pictures by themselves one would conclude that there is no opening whatever for flying in that area, but Commander Dyott has made a special study of the possibilities for aviation in that part of the world, and will, one believes, convince his audience that aeroplanes, seaplanes, and flying-boats will play a large part in its development. He should be particularly interesting to those concerned with civil aviation.

The lecture will be held, as usual, at the Royal Society of Arts, John Street, Adelphi, and tickets may be obtained from Mr. W. Barnard Faraday, The Royal Aeronautical Society of Great Britain, 7, Albemarle Street, W.1.

The American Aerial Service at Antwerp.

Colonel Gos and some officers of the American Army announced at the Town Hall at Amsterdam recently that they had been instructed to establish at Antwerp an American Military Aerial Service. The Communal administration has proposed two sites.



THE FLIGHT THAT FAILED.—A Front View of the Liberty Engine housings and propeller of the N.C.III.

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The WORLD of AERONAUTICS (continued)

A Good Flight.

The Swedish airman, Lieut. Elis Nordovist, made a good flight on May 13th. He covered nearly 625 miles in 8 hours 35 minutes in a Swedish-built Thulin aeroplane with a 90 h.p. Thulin engine.

The Death of Dr. Thulin.

On May 14th Dr. Enoch Thulin, a director of the Enoch Thulin Aeroplane Factory and the designer of the Thulin aeroplanes, was killed in an aeroplane accident off Landskrona by a fall from a height of about 3,000 ft.

A Night Flight.

In the darkness of the small hours of May 15th an aeroplane of the No. 1 Communication Squadron, R.A.F., carrying two passengers and nine bags of mails, flew from Kenley Aerodrome, near Croydon, to Paris against a powerful head wind in 4 hours 15 minutes.

The machine was a Handley Page bomber fitted with two 350 h.p. Rolls-Royce "Eagle" engines and piloted by Capt. George Chadwick, M.C., R.A.F. The navigator was Lieut. H. E. F. Saunders, R.A.F. A start was made from Kenley at 1 a.m. and Paris was reached at 5.15 a.m.

For the first 80 miles—that is, until the machine was well over the Channel—Col. Primrose, commanding the squadron at Kenley, was in constant telephonic communication with the aeroplane.

The ground staff at Kenley overheard Capt. Chadwick speaking to the R.A.F. aerodrome at Lympne, on the Kentish coast, asking for lights to be displayed. Capt. Chadwick then told Col. Primrose he had passed Lympne, and a little later Capt. Chadwick was heard speaking to Marquise, on the Flanders coast.

Flying in Spain.

A Handley Page machine piloted by a British lieutenant-colonel arrived at Barcelona on May 17th from Madrid with 14 passengers. The distance was covered in four hours. This machine is the first Handley Page to visit Barcelona.

The British aviators at Madrid have been received in audience by the King. The Queen and the Royal children visited the aerodrome on May 16th.

The Trial of R.33.

On May 16th the naval airship R 33 (Lieut.-Col. Hicks, R.A.F.), constructed by Sir W. C. Armstrong, Whitworth and Co., left Barlow aerodrome on a trial flight. Major Thomas, R.A.F., Captain Leetham, R.A.F., and Lieut. Hooley, R.A.F., were among those aboard. Captain Fairbairn Crawford represented the constructors. The flight was shortened owing to trouble with the elevator and rudder controls.

Balance in the Air.

Dr. Henry Head has written for the Medical Research Committee a paper on "The Sense of Stability and Balance in the Air" (Special Report Series, No. 28).

This paper is a critical analysis of certain phenomena which have been made a basis of acceptance or rejection of candidates for the Air Force.

"An identical stimulus can evoke," he writes, "in the same individual a varying response; what wonder that the action of the same physical forces may produce the most diverse effects upon different people." He cites the sensation which some people feel when descending in a lift. Some experience this, others do not, while "between these two extremes lie those who recognise this 'feeling' if the movement starts somewhat suddenly, but not under ordinary conditions.

"This sensation, like giddiness in the air, can be acquired. One young pilot knew nothing of any such 'feeling in the lift' until after an attack of influenza. . . . When he returned to duty 10 days later he found he had lost all confidence in the air, and was 'gripping his controls tightly and tensely.'"

Dr. Head does not pursue the subject of the effects of infection on the nervous system further than this, though other recent work would suggest that it is of first importance. He merely indicates that failure at a given time to pass a given test may not mean that a candidate is necessarily the victim of a permanent disease nor under a permanent disability.

"But, since it has been gained by practice, it can also be destroyed by any condition which lowers bodily or mental vigour; and this is the case not only with those who have adapted themselves to conditions in the air, but also with those in whom such confidence is innate."

Once this point of view is taken, it becomes obvious that the various tests which are considered in the report have a relative value only. Tremor, inability to stand on one foot with the eyes shut, giddiness when being rotated, and so on, may reveal the existence of some abnormal functional state. Their absence is not otherwise an indication of ability to fly. They may be quite temporary, or they may be due to some excess, e.g., alcohol, or great strain, in a healthy man.

A Voluntary Reserve Force.

The following letter has been received:—

Sir,—As it is apparent that the post-bellum R.A.F. will be quite small, it is useless to trust the Government to retain the supremacy in the air. The magnificent warning sounded by Sir Douglas Haig shows that he, like another great soldier (the late Lord Roberts), is able to see farther ahead than our politicians, as he is able to look forward to greater wars that are yet to come.

We are all aware that there are thousands of efficient R.A.F. officers who have been, or are being, demobilised against their will. The development of commercial aviation will not be sufficiently rapid to absorb these officers who are keen on aviation. Consequently, they will drift into other interests, and, in the course of a few years, we shall have lost what is the finest Reserve Air Force in the world.

May I suggest that those who are truly keen on the future of Britain in the Air should form themselves into a Volunteer Reserve.

I believe if a large number of the readers of THE AEROPLANE would express their willingness to serve in this Voluntary Reserve Force, it would be possible to arrange the details.

Possibly the authorities might be persuaded to turn over to the Voluntary Force some of the aerodromes which would otherwise be dismantled and to allot some of the machines that would otherwise be reduced to produce.

One remembers vividly how before the war, when Lord Roberts had forecasted the great upheaval which we have just lived through, a great effort was made to increase the Territorial Force, and to-day we recognise what those Territorials did for Britain in the black days of August, 1914. I want to see a similar Force composed of the best of young Britishers who served, or wish to serve in the R.A.F., and I sincerely believe that a few thousand pounds spent by the Government in the encouragement of such a Voluntary Reserve Force would save millions later on. May I ask you to throw your columns open to discussion of this scheme. ONE OF THE OLD R.F.C.

[The suggestion contained in the letter was first made in THE AEROPLANE in April 1914. It would be interesting to hear the views of readers to-day, and correspondence upon the subject will be welcomed.—Ed.]

The Target Case.

Following on a claim for £10,000 brought before the Royal Commission on Awards to Inventors a fortnight ago, by Lieut. Power, R.A.F., with respect to an aerial target used to train flying officers in "spotting" for artillery, another claimant appeared before the Commissioners on May 19th in Major MacCallum, R.A.F., who urged that the invention was his.

Major MacCallum explained that he had seen reports in the papers that somebody had been claiming for an aerial target. "From the description of it," he proceeded, "I found it to be almost identical with the one I had going in the end of 1915, and have been using ever since."

Applicant said his target was in use at the School of Military Aeronautics at Reading while he was in command. He had never heard of the Power target until he saw the report in the papers. His target consisted of a representation of an actual piece of the front showing an area including Neuve Chapelle, Armentières, and Lille. His target was so realistic that airmen had mistaken photographs of it for photographs of the actual front.

The Chairman (Mr. Justice Sargant) pointed out that Lieut. Power had never claimed to be the first to introduce a reproduction of the actual scene as a training target.

The points for which he claimed on the ground of novelty was that, as the result of his system of illuminations, flashes could be produced anywhere and not at fixed points, however numerous. Secondly, that different areas could be photographed on the screen; and, thirdly, the fact that the apparatus was portable. Moreover, Lieut. Power's method or the adaptation of it had been used in about 330 cases.

Major MacCallum said that some 25,000 pupils were trained on his target, which was adopted at Oxford, and, he believed, also in Canada.

The Chairman said he had no doubt that the MacCallum target, being so much larger than the Power target, was in some respects better. But the great advantage of the Power target was its portability.

Major MacCallum said that as he was the inventor of the first target used for training the Air Forces he thought he had a right to claim.

The Chairman: Yes; but we have to sift out those claims and see if there is evidence of such exceptional merit as would justify us in making an *ex gratia* award.

Mr. Trevor Watson, for the Ministry of Munitions, said it was not disputed that there had been a substantial "user" by the authorities of Major MacCallum's invention, which had been continually in existence in the school at Reading from early in 1916 till after the date of the armistice.

The award of the Commissioners will be made known at a later date.

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PARIS NOTES

MAY 19th.

The Tour de France Aérien, to be held from August 24th to Sept. 1st, due to the initiative of the "Echo de Paris," will be a cross-country contest in the highest sense of the term. It will be held under the Sporting Commission of the French Aero Club, who have already decided on all the main conditions, controls, stages, and prizes. It is to be open to French or Allied competitors and machines. It is to be hoped that the British entrants will be numerous.

The following is a précis of the conditions and general information of interest to possible competitors :—

Each competitor will hand to the Aviation Commission of the French Aero Club before Aug. 9th, midday, two "barometres enregistreurs" which will be placed on their machines. One of these two will be considered as the official recording instrument.

Machines must be presented at the starting aerodrome before 6 p.m., Aug. 19th, for official sealing of vital parts, etc.

Competitors will be allowed to present spare parts, for stamping, to a quantity equal to the number of corresponding parts in the machine. During the contest these parts may be replaced providing that they have been carried in the machine during the flights.

The weight of the machine will be determined and admitted after a preliminary flight, during which the machine will fly with the intended load and must climb to 3,500 metres in one hour. During this flight there will be on board only the crew necessary to fly the machine. Passengers' weight will be replaced by ballast.

THE ROUTE.

1st Stage—Paris, Rouen, Angers, Le Havre, Deauville, Dinard.

2nd Stage—Angers, Romorantin, Bordeaux.

3rd Stage—Bordeaux, Marseilles.

4th Stage—Marseilles, Montpellier, Lyons.

5th Stage—Lyons, Strasburg, Metz.

6th Stage—Metz, Lille, Paris.

On the route will be established "flying controls."

At each stage the controls will be open for three days from 7 a.m. to 8 p.m. No departure will be allowed after 3 p.m.

The controls will be : Paris, Aug. 24th, 25th, 26th ; Angers, Aug. 24th, 25th, 26th ; Bordeaux, Aug. 26th, 27th, 28th ; Marseilles, Aug. 27th, 28th, 29th ; Lyons, Aug. 28th, 29th, 30th ; Metz, Aug. 29th, 30th, 31st ; Paris, Aug. 30th, 31st, Sept. 1st.

CLASSIFICATION.

The classification for prizes will be arrived at by adding together the points gained each day. Ten points will be given to the machine accomplishing the first stage without stop on the opening day. A machine arriving at the control the next day will only get 7 points.

Forced or accidental landings during a stage, and accidents, will be penalised as follows :—

Unauthorised landing, 1 point ; change of part (outside conditions of Art. No. 4), wheel, airscrew, landing strut, stabiliser, rudder, axle, 1 point ; radiator, 2 points ; cylinder, 5 points ; crankshaft, 5 points ; wing, 5 points.

Every machine must accomplish the stages with at least a pilot and passenger (weight 65 kilos and minimum age 18 years). There will be *added* a quarter of a point for any passenger carried in addition to the above. Only passengers effecting the whole voyage will be counted.

PRIZES.

General Classification :—First prize, 20,000 francs ; second, 15,000 francs ; third, 10,000 francs ; and fourth, 5,000 francs.

There will be a classification from Paris to end of first stage, from Paris to end of second stage, from Paris to end of third stage, and so forth. Each of these seven classifications will have a prize of : First, 3,000 francs ; second, 2,000 francs ; third, 1,000 francs ; fourth, 1,000 francs ; fifth, 1,000 francs ; sixth, 1,000 francs ; seventh, 1,000 francs.

MILITARY PILOTS.

Military pilots will be allowed to compete in accordance with special provisions approved by the military authorities.

All entries must be sent to the "Commission d'Aviation de l'Aéro Club de France" between June 2nd and 20th, accompanied by 1,000 francs, which is reimbursible if the machine completes the first stage. Entrants must acquaint the Commission before 6 p.m. of Aug. 11th with the names of pilot or pilots, licensed, who will partake in the contest.

In addition to the above contest I learn that the "Petit Journal" will organise a "Circuit des Champs de Bataille" between July 4th and 7th. The total distance to be covered will be 1,200 kms. in stages of 200 kms.

A NEW HEIGHT RECORD.

During the week Sadi Lecointe has raised the French height record to 8,400 metres, which is an advance of 450 metres on the last official one. He accomplished it on a 300 h.p. Hispano-Suiza Spad-Herbemont. This must not be confused with the present world's record held by an American and "homologed" at 8,670 metres, nor the unofficial world record of 9,272 metres by Captain Lang in January of last year.

The great French Ace, Fonck, who has not flown the last seven months, has gone into flying training in preparation for an attempt on the world's height record on a Nieuport-Hispano, 300 h.p.

TO THE MEMORY OF FALLEN AVIATORS.

France possibly holds the record for monuments erected to her fallen aviators, military and civil, beginning with the one to Captain Ferber on the Promenade at Boulogne-sur-Mer. The latest is one to Pégoud erected as the result of a subscription by "L'Auto." M. de Gastebois is the sculptor. Shortly, also, a monument to Guynemer will be unveiled at Nice.

HANDLEY PAGE ACTIVITY.

The Handley Page machines make good birds of passage. At all points of the compass in France they have been landing and leaving during the last week. Marseilles, Chalon, Lyons, Pau, and Tours are only a few of the points where their presence has been recorded. Maybe there is some connection between this activity and Mr. Handley Page's visit to Paris recently. Mr. H. White Smith, of the Bristol Company, was also an aeronautical visitor of interest. He came in the capacity of a delegate to the International Aeronautical Commission.

FLYING OVER TOWNS.

General satisfaction is expressed at the action of the French War Ministry in issuing orders that pilots of aeroplanes and airships shall not fly over large towns except at a height which will allow them to reach a suitable landing place in case of engine breakdown. They are forbidden to stunt over towns. They must not pass over Paris at all, unless in receipt of specific instructions, and they must not fly over racecourses, etc., or anywhere where a large number of people is assembled.

CIVILIAN AVIATION.

A new company that intends to start a Paris-London service on June 1st will commence it with one Goliath and four or five G.6's, which, being interpreted, are new Friedrichshafen biplanes handed over by the Boche to the French according to the terms of the Armistice. The Government is losing no time in getting them off their hands, and at good prices, too. This firm has also bought some G.3s and G.4s, likewise old Boche machines. The French pilots are very enthusiastic about them as regards their "maniability," some preferring the G.6 to the Goliath even, which is unquestionably the best machine of its class of French construction.

SWISS NEWS.

The works of the Aero School at Bellevaux have just produced a new machine called A.21, which has been tried at the Blecherette Aerodrome. It is a two-seater biplane with a carrying surface of 21 m. 50 square. Motive power is obtained from an 80 h.p. rotary engine.

The Schlieren Factory is constructing a new machine to the designs of Mr. Schaedler, himself an aviator.

A new aerodrome has been opened at Schwamendingen, near Dubendorf.

Geneva has its first private school of aeronautics, founded by one M. Fernand Zosso, an engineer. Diplomas and certificates will be delivered when studies are completed.

From 1914-1918 Swiss military aviators made 40,111 flights, representing 9,508 hours and 1,645,895 kilometres. Thus the work accomplished by the whole of Swiss military aviation probably does not equal that of four first-class Allied aviators.

A new machine has been constructed in the Federal works at Thoune, called the "Haefeli." It has a motor of 200 h.p. made by Wintertours, the locomotive people.

Geneva and Lausanne are struggling keenly to obtain from the Federal Committee the necessary money for the creation of a vast aviation field in the organisation of which each wishes to be first.

BELGIAN NEWS.

It is reported that civil aviation will commence on June 1st. It is certain that the first routes to be run will be Brussels-Paris and Brussels-London. Demobilised military pilots have already been offered jobs.

What is probably the first case of its kind is that of a Belgian aviator sentenced to death as a traitor for spying during the closing months of the war. His name is Bauwens, a pre-war pilot who took part in many meetings, chiefly in India.

La Banque d'Outremer has formed a syndicate with the idea of forming a powerful aircraft society to exploit aviation in the Congo as well as Belgium. All the big banks are concerned in the affair.


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THE TRANS-ATLANTIC COMPETITION.

Since the last issue of this paper two attempts to cross the Atlantic Ocean from Newfoundland to Great Britain have been made. One was partially successful in that half the flight—that stage to the Azores—was completed within the stated time. The other, by Hawker, has ended in failure.

It is appropriate at this moment to detail once again the machines entered (and ready to fly) for the competition, or intending to attempt to fly over the course without competing for the prize.

They are as follows:—

BRITISH.

Rolls-Martinsyde machine ("Raymor"). One 285-h.p. Rolls-Royce Falcon engine. Flight duration, 27 hours at 110-117 miles an hour.

Pilot, Mr. F. P. Raynham.

Navigator, Captain C. W. F. Morgan, R.A.F.

Sopwith machine ("Atlantic").—One 320-h.p. Rolls-Royce Eagle Mark VIII. engine. Flight duration, 25 hours at 100-110 miles an hour.

Pilot, Mr. H. G. Hawker.

Navigator, Lieut.-Commander K. Mackenzie-Grieve, R.N.

AMERICAN.

Naval Seaplane N.C.1.—Four Liberty engines of 1,600 total horse-power. Flight duration, 20 hours at 70 miles an hour.

Commander, Commander J. H. Towers, U.S.N., and crew of four.

Naval Seaplane N.C.3.—Details as above.

Commander, Lieut.-Commander P. N. L. Bellinger, U.S.N., and crew of four.

Naval Seaplane N.C.4.—Details as above.

Commander, Lieutenant-Commander Read, U.S.N., and crew of four.

On Thursday, May 15th, the American seaplanes N.C.1 and N.C.3 made an abortive attempt to start on their long flight to the Azores, but as far as can be gathered they failed to rise from the water and had to return to port performing as motor boats.

The following evening the three machines left Trepassey Bay, Newfoundland, in the following order: N.C.3 at 6.6 p.m., N.C.4 at 6.7 p.m., and N.C.1 at 6.9 p.m. (American time). The entire course to the Azores was patrolled by American ships of war, which showed all lights throughout the night.

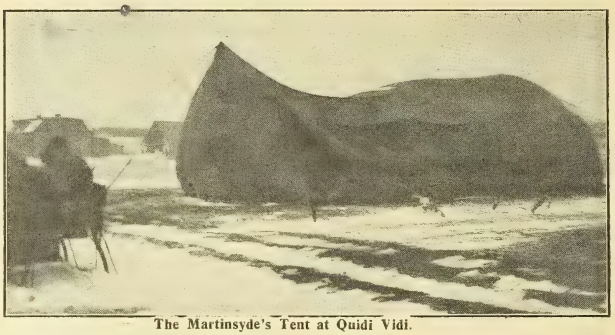
The N.C.4 flew without incident for 15 hrs. 13 mins., alighting at Horta, Fayal Island, Azores, at 1.25 p.m. Greenwich time. The distance flown was about 1,400 miles.

Lieutenant-Commander Read, U.S.N., flew at a height of 3,000 feet until after sighting the island of Corvo in the Azores. He then ran into a fog and consequently came down to a height of 200 feet, which he maintained until the end of the flight. He spoke continually to the patrol vessels by wireless and found no difficulty in keeping his course.

N.C.1 flew into a fog and had to alight 100 miles from Horta. Later in the day it was salved by the steamship "Iona." The machine itself was badly damaged in the attempt to tow it.

N.C.3, the least fortunate of the three, also flew off the course through the rising fog. This machine was missing for some time and was finally located on May 19th seven miles from Porta Delgada, proceeding to that place under her own power.

On May 18th, inspired by a determination not to be defeated by the American pilots, Mr. Hawker and Lt.-Commr. K. M. Grieve, R.N., left Newfoundland at 5.45 p.m. (Greenwich time). On his way out to sea he dropped the wheels of his chassis on the Quidi Vidi aerodrome, where Mr. Raynham was getting ready to start. He then passed out to sea, flying steadily in a favourable wind.



The Martinsyde's Tent at Quidi Vidi.

During the night the wind changed and blew strongly from the east thus reducing considerably the speed of the machine in relation to the earth.

Nothing was heard of the machine until late on Monday night, when the Admiralty received the following message from Castletown wireless station:—

"Sopwith machine down in 52 deg. 30 mins. north, 11 deg. west."

The position indicated is about forty miles west of Loop Head, at the mouth of the Shannon. It is understood, however, that no reliance whatever can be placed on this message. The Admiralty have instructed the Naval authorities at Queenstown to send out all the available vessels on the station to search over a wide area of sea west of Ireland.

Mr. Raynham and Captain Morgan, R.A.F., attempted to begin their flight at 7.15 p.m. (Greenwich mean time) on May 18th, from the Quidi Vidi aerodrome, Newfoundland. His machine rose after a run of a few hundred yards. While flying at a height of a few feet the machine struck a hummock in rough ground. The chassis buckled and the machine turned over and was very badly damaged. Pilot and passenger escaped almost without injury.

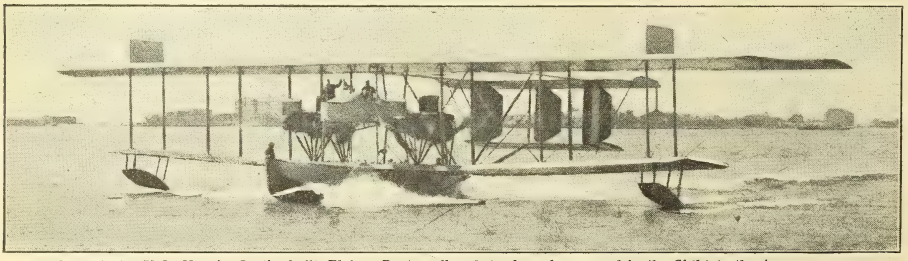
The U.S. Naval Airship C.5.

The U.S. Naval airship C.5 left Long Island on May 14th and flew to St. John's, Newfoundland, the following day, after a flight of 25 hrs. 40 mins. The distance covered was 900 miles.

On the evening of the same day she broke adrift from her moorings, luckily without any of the crew on board, and drifted out to sea. Nothing has since been heard of her.

The following particulars of the C.5 are of interest. Length 192 ft., diameter 42 ft., length of car 40 ft., engines, two six-cylinder 120 h.p. Union motors.

The crew said that the voyage from Montauk Point was uneventful until early in the morning. The weather was pleasant, and St. Pierre was sighted just after daybreak. Then the airship entered a belt of fog and rain, which drove her north-west over the interior beyond Placentia Bay, where she spent a couple of hours seeking to ascertain her position. Finally, about 9.30, she got in touch with the wireless telephone on the cruiser "Chicago," and reported herself, and by a suggestion from the ship was able to find Whitbourne Junction, a point on the railway line 60 miles distant, whence she made her way steadily to St. John's.



One of the U.S. Navy's Curtiss-built Flying Boats, alleged to have been used in the flight to the Azores.


Westland Seaplane


D.H. 4 D.H. 9

Westland Weasel


Westland Wagtail

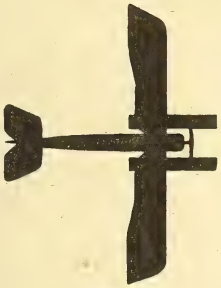
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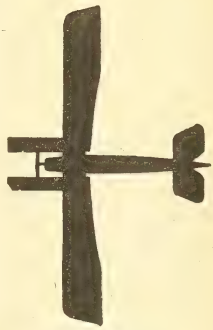
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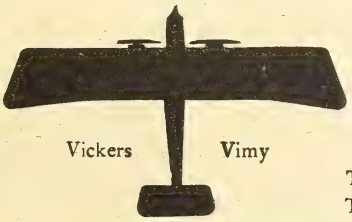
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TO MADRID AND BACK.

The following has been received from the Air Ministry :—

The flight of four British aeroplanes to Madrid is one of exceptional brilliance, demonstrating unmistakably the manner in which modern aircraft in the hands of clever and daring pilots can overcome the worst natural obstacles and the most extreme vagaries of the weather.

A flight over the Pyrenees is at any time no light undertaking, and in the circumstances in which it was performed by Lieut.-Col. W. D. Beatty on the outward journey from Pau to Madrid, at a time when thunderstorms, hail, rain and dense fog were encountered between heights ranging from 900 to 15,000 feet, it ranks high in the achievements of aviation.

Four machines took part in the venture. Two were of the D.H.4 type piloted by Lieut.-Col. Beatty and Capt. Square, carrying as observers Lieut. Jeffrey and Lieut. Anderson, respectively. The third was a Bristol Fighter piloted by Major Payne, accompanied by Major Coe, and the fourth machine was a V.1500 type Handley Page (four engines) with two pilots, Major Darley and Lieut. Kilburn, an observer, Lieut. Murray, and three mechanics. All of these machines were equipped with engines of Rolls-Royce type.

Flying in Bad Weather.

The big Handley Page was the first to leave England, starting early on Tuesday, the 6th, and, after an attempt to cross the Pyrenees in severe weather on the same day, turned back and made a successful landing in difficult conditions at Biarritz. Low clouds delayed further progress on that day.

Despite adverse local conditions the three lighter machines left Biggin Hill early the following morning, relying on weather reports which stated that blue sky might be expected in the Channel. Col. Beatty left the ground at 8.17 a.m., reaching the coast between Beachy Head and Seaford at 8.43 a.m. and striking the French coast east of Fecamp at 9.19 a.m. Over the Channel thick fog banks covered the sea and it was necessary to fly at 6,000 feet to avoid them. Tours, about 100 miles south-west of Paris, was reached by Col. Beatty at 10.59 after a flight of 275 miles in 2 hours 42 minutes. Visibility at Tours was poor on account of considerable cloud and haze.

The Bristol Fighter landed at 11.50 a.m., and as it was the slowest machine efforts were concentrated on it to refill the tanks and get it away with the others on the second stage of the journey. Col. Beatty's machine was unfortunately held up by the discovery of a break in the exhaust pipe which caused a delay of nearly an hour whilst the defect was temporarily repaired.

Pau was reached on the same afternoon and the necessity for further repairs to Col. Beatty's machine again delayed the immediate resumption of the flight.

It appeared unwise to attempt a non-stop flight to Madrid on the same evening, and it was therefore decided to endeavour to reach Vittoria. The Handley Page machine had found the weather near Biarritz too bad on the day before and was also at Pau, so that it was arranged to start in such order on the following morning that all four machines might arrive together at Madrid at about 10 o'clock.

This programme was by no means so simple a matter as the voyagers expected. The following extracts from Col. Beatty's report illustrate the difficulties which had to be surmounted before the Pyrenees could be passed.

Colonel Beatty's Report.

"I left Pau at 6 p.m., reaching S. Sebastian at 6.56 p.m., against a fairly strong head wind. For the last half hour the visibility over the hills had been very bad, and as fog clouds were blowing in from the sea, it was obviously going to be a question of minutes whether it would be possible to get across in front of these or not. The fog reached the mountains before me and I tried to go over it. At 7,000 feet I was still in dense cloud, and occasional clear holes showed that the 'dirt' of a thundery type ran up to at least 15,000 feet.

"Going back till I saw the coast I came down over S. Sebastian and tried to go under the fog.

"After a little way up the valley at about 900 feet it could be seen that the fog was getting lower and a couple of miles ahead was lying just on the bottom of the valley. A short way farther a fork enabled me to turn back towards S. Sebastian at 7.18 p.m. and I decided to return to Pau, arriving at 7.58. From Hendaye, oil trouble developed which was found next day to be due to dirt stopping up the filter and pipes. This was got right by 2 p.m. on the 8th, and I was just about to start again when the Handley Page which had set off about midday returned reporting hopeless weather near the coast with severe thunderstorms."

Meanwhile, Capt. Square on the other D.H.4 had landed at Hendaye on Wednesday evening owing to oil trouble, while the Bristol progressed as far as S. Sebastian,

Bad weather prevented another effort to cross until after midday on the 9th. Heavy rain had been falling all the morning, but a Nieuport machine which arrived from a neighbouring flying school reported blue sky towards the Pyrenees and a start appeared practicable. Col. Beatty's report describes how Madrid was reached through hail and dense mist.

Through Hail and Mist.

"At 3.11 p.m. we left the ground against a light N.E. wind. Climbing steadily to 7/8,000 feet, we went through the first low layer of cloud quickly, followed by Capt. Simon on his Nieuport. The ground was frequently visible till near the highest point we had to cross. Here we ran into a thick bank and, not getting through it after 5 to 10 minutes, started to climb above. We climbed to 15,000 feet through alternating nail and dense wet blankets of fog. As there was no sign at all of getting through and the hail was becoming more painful we started to descend.

"It was not easy to keep a good course as the clouds were very bumpy. The engine also was annoyed by the moisture and required a lot of nursing, dropping as much as 200 revs. at times. Descending to 7,000 the wing tips were still hardly visible. I had just decided not to risk descending lower and had started to turn back for Pau when we came out of the cloud into visibility somewhere in the Calahorra-Alfaro region.

"There are a good many possible landing grounds in the broad valleys in this region. From here the clouds were mostly at 5,000 with good visibility below them, and we kept fairly closely to our course of 240 degrees, keeping to the south when it became necessary to go off the course to avoid a hill. On one or two occasions we only scraped the tops of cols by feet at 4,500, especially at what I think was the Sierra Tabanera. . . . Striking the railway which runs south to Burgo de Osma, I followed it thinking it was one joining up with that in the valley of the Henares, and then turned to west along the Duero, imagining it was one of the west-running stretches of the river Henares. I soon found it ran too much to the north and suspected I was going towards Aranda.

"Consulting with Lieut. Jeffrey I turned on a 220 degrees course as he advised and soon confirmed our estimates of position by finding the Sierra de Ayllon. Torrelaguna was later identified after first identifying the river Lozoya.

"Just as we reached the west of Madrid the second main petrol tank gave out and we landed at 6.56 p.m. with only about two gallons left in the gravity tank."

The Arrival at Madrid.

All four of the machines had won through to Madrid on Sunday, the other pilots having followed the coastal route through S. Sebastian and Vittoria, and a demonstration flight with Spanish officers as passengers was carried out over the Spanish capital.

The weather conditions on Sunday gave every promise of good weather for the following day and arrangements were made by Col. Beatty for a start on the return flight as soon after daybreak as possible. Monday broke fine with good visibility, as is apparently normal in Spain, and Col. Beatty left the aerodrome at Cuatros Vientos at 6.15 a.m. on his memorable flight.

A route was chosen which avoided the difficult landing country on the direct line between Madrid and Pau. An examination of the map indicated that a route passing near Zaragoza and thence straight to Pic du Midi would probably be best for commercial aviation. Visibility was so good during this flight that the country could be carefully studied over a great area and the result of observation from the air fully confirmed this opinion.

It was found also that good landmarks exist to guide pilots over this route and, except for comparatively narrow stretches of Sierras, possible landing grounds were observed almost the whole of the way to Jaca. The only fog seen by Col. Beatty in Spain was in the valley of the Ebro, near Zaragoza.

When approaching the Pyrenees the aviator experienced the peculiar sensation of being considerably below their tops, although actually, when some distance off, his machine was at least 3,000 feet above the highest peak.

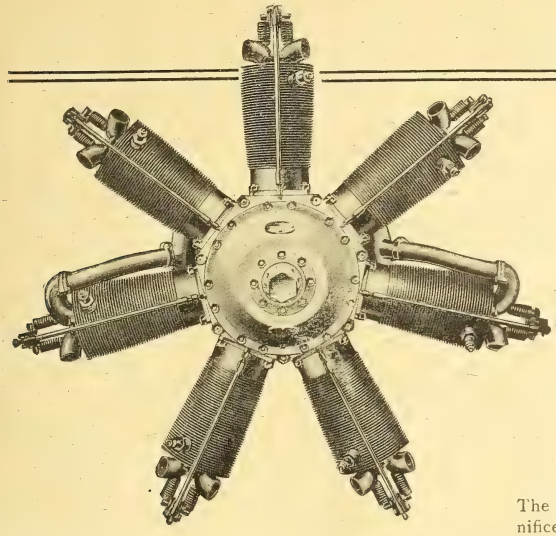
The return flight of Col. Beatty was uneventful, though remarkable for the fact that after leaving Tours the clouds were so thick that the ground was only occasionally seen and the flight to England was made almost entirely by following a compass bearing with due allowance for the wind. Fécamp on the French coast was momentarily observed through the clouds, and nothing more was seen until Eastbourne appeared directly below the machine, through a hole in the clouds.

From here onwards the clouds became thinner and more scattered. A landing was made at Kenley at 6.10 p.m., so that the journey was completed in just five minutes under the twelve hours, with two stops—at Pau and Tours.

The following are the times taken to cover each stage of the return trip, and the distances traversed :—

	Hrs.	Mins.	Miles.
Madrid to Pau	3	5	295
Pau to Tours	2	48	285
Tours to London	2	47	275
	8	40	855

The average ground speed of the machine was, therefore, 98.6 miles per hour, calculated from the above distances which represent the length of straight lines drawn from point to point. It was at first thought that Col. Beatty had followed the coastal route from Madrid to Pau, via Vittoria and S. Sebastian in which case the total distance would have been 987 miles as stated in the earlier reports.



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A REPLY TO ROGER BAYONS.

"The toad beneath the harrow knows
Exactly where each tooth point goes.
The butterfly upon the road
Preaches contentment to that toad."

Even to those who have not read their AEROPLANE with sufficient diligence to remember "Roger Bayons'" earlier pronouncements on military subjects it will be obvious that he is a soldier.

More earnest students will have discovered in his *dicta* evidence of his owning a well developed example of the "Staff" type of mind.

Thus even if he does not actually wear those encarnadined embellishments which would complete the analogy physically, his nimble detachment of mind from the hard facts of existence is evidence of a lepidopterous character.

As a soldier, he has seen discipline, so he knows what it is—but he has gone further—he has apparently looked it up in the dictionary and so knows what it is for, and there is obviously, to his mind, little more to be said upon the subject.

THE DAWN OF UNDERSTANDING.

However, for a soldier, he is distinctly threatened with glimmerings of intelligence. It will be noticed that he does not propose to assemble aero engines by numbers. This is, at any rate, something to be thankful for.

As to mechanics—after the "necessary" parades—"let them revert to type and be as dirty as they please."

THE FUNDAMENTAL TROUBLE.

Here one reaches in very truth the essence of the matter.

The trouble with the soldier type of mind is that it does not desire to see the rank and file of the R.A.F. a body of smart mechanics, because the idea of such a combination is beyond the range of this type of intellect. They stop short at the idea of converting mechanics into second-rate imitations of infantrymen.

Usually the object of their efforts becomes useless either as a mechanic or as a soldier, and the result is visible to the nakedest of eyes in the disorderly and useless mob now forming the major portion of the alleged Air Force.

AND ITS TYPICAL RESULT.

Their nearest approach to success is "The Snipe's" ultra smart leadswinger, who, judging by precedent, may be expected to terminate a successful career of undiscovered crime by pleading his Service character in mitigation of his due punishment when he eventually appears in one of the civil courts.

TO POINT THE MORAL—WITHOUT ADORNING THE TALE.

The following true story—though it has nothing to do with the Army, being in truth a purely Naval matter—has a certain bearing upon the matter now in dispute.

Most soldiers—I mean soldiers and not mere temporary officers of his Majesty's Army—would dispose of it by merely remarking, "Ah, but then that was the Navy"—and I quite realise that it will produce no effect where the effect is most needed.

A TACTFUL C.O.

In the early days of our late unpleasantness with our Teuton cousins the R.N.A.S. established an experimental factory staffed entirely by officers and men of that Service.

This establishment originally was run as an independent command, with its men housed in quarters of their own quite close to the workshops.

The Commanding Officer was a regular Naval Officer, possessed of sufficient sense not to interfere in the running of the establishment—except to award punishment and to sign letters.

Both these functions he discharged admirably, the first with a just firmness and the second with a discreet illegibility.

AND A COMPETENT STAFF.

The rest of the officers were, with the exception of a warrant officer storekeeper, entirely civilian engineers put into uniform and all of them by the Grace of God without Naval or Military training, but possessed of a sense of decency and order. These officers were, in fact, responsible for the routine and discipline of the establishment.

A REASONABLE ROUTINE AND THE NATURAL RESULT.

Every morning after breakfast all hands fell in outside their quarters and were marched to the workshops in charge of the officer of the day.

There they were inspected and dismissed to their duties by him. Any man found at this inspection unshaved, dirty, or without proper overalls met the C.O. later on in the day.

Every evening after work all hands again fell in for inspection and marched home. The total time on parade and marching was under half an hour per day.

While this state of affairs lasted, all hands, with the exception of the one or two black sheep who can always be found in such a body, were clean, smart, and worked excellently. They respected their officers and showed that they respected them, both by the formal methods laid down in K.R. and A.I., and by more convincing ones.

It was extremely unusual to see a man lounging about after working hours in dirty working clothes, and offences of any kind were rare.

PARADISE LOST.

Two years of this happy state of affairs was too much for the authorities.

The Commanding Officer was removed to another sphere of action, and the establishment was placed, for command and discipline, under an adjacent air station.

The men were removed from their own quarters to an extension of those at the air station, nearly a mile from their work, and the engineer officers were relieved of all but their technical duties.

"DISCIPLINE" AT WORK.

After breakfast the hands, in common with those of the air station, were on parade for 30 minutes. Three-quarters of them then spent 20 minutes marching to work. The remaining quarter were kept for a further hour's drill to "smarten them up."

Every evening they marched to the air station, where a quarter of an hour was spent in ingenious manœuvres designed to bring this body of men to their appointed place amongst the greater mass belonging to the air station, so that the total time spent on the homeward march became 35 minutes. Total time lost, as compared with the original routine, 1¾ hours per man per day.

DISCONTENT AND DISORDER FOLLOW.

And at the end of three months they were as discontented as the present average of the R.A.F., their work had deteriorated, their standard of personal cleanliness had dropped to the minimum compatible with escaping reprimand from their disciplinarian officers, overalls disappeared, they wore their working clothes at work and after it, and they treated their Technical Officers with growing disrespect.

CONTROL VERSUS COMMAND.

No soldier—probably, no sailor—can be expected to understand why, but any person who has had to exercise control, as distinct from command, over men, could have predicted this result.

THE TOAD.

A VISIT TO THE HOUSE OF BOLO.

BY G. L. D.

If you are a pilot in the R.A.F. on the verge of demobilisation and wish to obtain some information, a graduation certificate, or some such similar thing, a most unprofitable day, very upsetting to the temper, can be spent at the great headquarters of everything aerial, Bolo House, Strand, W.C.2.

On arrival you fill up the usual inquiry form and pass, and then follow a Brownie along corridors, up a lift, more corridors, perhaps a few stairs for variety, and finally, when tired out, having walked many miles, your guide disappears.

Do not try to follow her, or you will assuredly lose yourself, or perhaps enter a messengers' lobby, those sacred rooms where only messengers may tread, and there you will be stared at by many Brownies of all shapes and sizes, all drinking tea, until, covered with confusion, you flee and do not stop until you reach the end of a blind passage.

Then you think you will inquire the way. You inquire, but no one knows, and then it is best to go down to the entrance hall and start again.

When your guide disappears you should stay where you are, and then another Brownie will suddenly arrive from nowhere, whisper, "Follow me," and off you go again.

Eventually you arrive outside the great man's door and take your place at the end of a queue which lessens very slowly. You watch resplendent officers, ancient civilians, and beautiful girls rushing or sauntering to and fro, and wait.

If your luck is out, just before you are going to be interviewed the great man goes out, either to a conference or to lunch, and you are advised to return at a later hour. However, you may be lucky and get an interview, and then you will be told with regrets that that department does not deal with graduation certificates, and are advised to go and see Captain Smith-Porkins at the Adelphi Hotel.

After a long journey you arrive there. He is also very sorry for you, but can be of no assistance—why not go to see Major Simpkins-Short in the Air Ministry?

If your patience is not then exhausted you go, and you may go much farther and eventually arrive back with surprise at the room from which you started. However, you will eventually learn that you must get your graduation certificate from the training squadron where you graduated, and as that has been disbanded and closed down you return home with a sorrowful heart and aching limbs.

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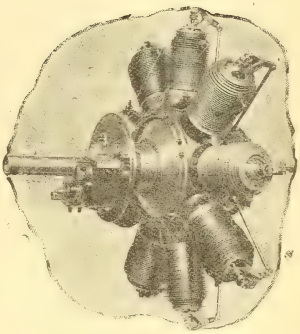
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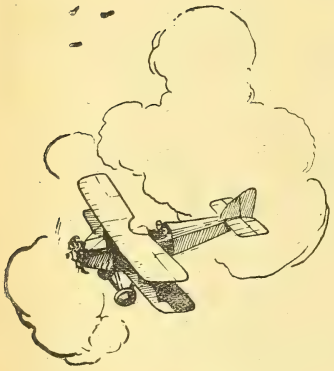
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THE WEEKLY COMMENTARY.

In continuation of the articles on Commercial Aircraft Design Captain Sayers contrasts a machine designed for the carriage of mails with the previously discussed passenger machine, and shows that, if the mail-carrier is designed for mail-carrying alone either a better performance with the same engine or an equal performance with a lower-powered engine can be obtained, as compared to the passenger type designed for the same total load.

Descriptions and illustrations of the De H. 10 and De H. 10a types of twin-engined machines conclude the instalment of "Modern British Aircraft" which refers to the products of the Aircraft Manufacturing Company, Ltd.

A further note on the history of the Steel Wing Company and their work in the development of all-steel construction appears on page 2036.

This should be read in conjunction with the abstract of Dr. Thurstan's paper on the Metal Construction of Aircraft, read before the Royal Aeronautical Society, which will also be found in this number.

It is of interest to note that the first attempts to build aircraft of steel, except those based on the use of steel tube, were financed by Mr. E. V. Sassoon, who in 1911 took up the patents of a Russian inventor named Mayro and developed them to a certain extent. It is claimed that the various Mayro patents cover the whole system of locally stiffening thin strip steel by longitudinal corrugations, and the Steel Wing Company's work is carried on under these and numerous other patents.

The Steel Wing Company's work therefore appears to be in direct and continuous succession from the earliest recorded attempts in this direction, and it is curious that Dr. Thurstan, whilst giving due credit to a number of other designers who have all more or less followed the same basic principles, should have omitted to mention the Steel Wing Company's work.

COMMERCIAL AIRCRAFT DESIGN.—XII.

MAIL CARRIERS.

By Capt. W. H. Sayers, late R.A.F.

It will now be considered what modifications could be made in the passenger-carrying machine which was described in the instalment of April 23rd and illustrated in Fig. 16, if the load to be carried consists of 1,200 lbs. of mails instead of 1,200 lbs. of passengers.

The average letter of commerce is about 4½ by 5½ ins., and of a thickness depending on the amount of enclosed paper. Roughly, if a pile of letters of these dimensions is made such that its height under slight pressure is one inch, the pile will be found to weigh from 8 to 10 ozs. This is roughly at the rate of 50 cu. ins. per lb. weight. For 1,200 lbs., therefore, the space required will be 60,000 cu. ins., or nearly 35 cu. ft. It will be remembered that the space occupied by the passenger cabin of Fig. 16 was 9 ft. by 3 ft. by 4 ft. 6 ins. = 121.5 cu. ft., or 3½ times as much.

Taking the same available cross section in the fuselage for useful load as in Fig. 16, i.e. 3 ft. by 4 ft. 6 ins., a total length of a little less than 3 ft. will suffice for the mail load.

This presupposes that letters are properly packed, and not merely thrown into sacks and dropped into the machine.

It is practically certain that such packing will be necessary, and that letters for aerial post will have to conform to certain standard envelope dimensions to facilitate packing, otherwise the cost of transport will increase. It may even be necessary to charge by bulk rather than by weight.

Since the load can be packed into so much shorter a length, it is obviously possible to bring all the loads closer up to the centre of gravity. The pilot's and mechanician's seats may be brought up to the trailing edge of the upper wing, and, as these seats can be high in the fuselage, a greater depth is available under their feet than that under the passengers' floor boards in the passenger machine.

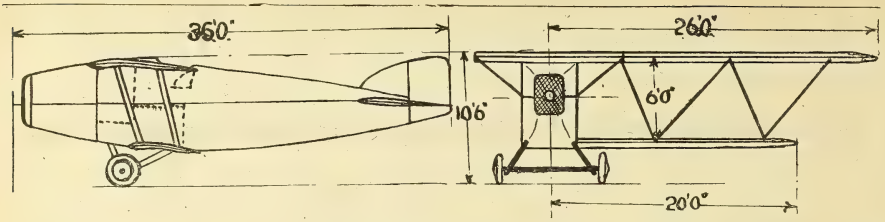
This allows for a deeper and therefore shorter petrol tank.

In the passenger machine there would be difficulties in the way of completely bracing the fuselage over the length occupied by the cabin, which would call for a heavy form of fuselage construction over this part. Also, seat bearers, seats, cushions, and particularly window glass would total up to a very considerable weight, which is no longer required if mails are the only load to be carried.

It is estimated that the saving which could thus be made in the weight of the fuselage and its fittings alone without altering the overall dimensions, will be about 300 lbs.

As a result of this saving it will become possible to reduce the wing surface the size of the tail plane, or the length of its lever arm, and even the weight of the chassis. Roughly, it should be possible to save from 450 to 500 lbs. in the total weight of the structure in this manner.

If the performance of the machine is of the greatest importance, and for mail work speed is likely to be a most vital matter, it will probably be advisable to content oneself with the saving already in view, and instal the same power plant of 600 h.p. which was used in the passenger machine, thus obtaining a rather better all-round performance.



HIGH SPEED MAILCARRIER.

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Fig. 18.

This leads one to the machine sketched in Fig. 18, which differs very little in appearance from Fig. 16.

The fuselage has been slightly shortened, and has been moved slightly farther aft relatively to the wings, to bring the machine to approximately the same balance as the passenger carrier. The mails are carried in a compartment 3 ft. by 3 ft. by 4 ft. 6 ins., immediately aft the engine.

The upper plane span has been reduced from 55 ft. to 52 ft., the chord remaining unaltered. The lower wing has not been changed, and the gap is the same as in Fig. 16.

The total wing surface has been reduced by 30 sq. ft.

The total of weight for the same total of fuel and cargo has dropped from 7,200 lbs. to 6,750, the loading per sq. ft. is practically unaltered (10.5 lbs. against 10.6), and the weight per h.p. comes down from 12 to 11.2 lbs.

At this weight and with this power the machine should have a very considerable margin of spare power at 120 m.p.h., or a considerably higher maximum speed if flown at full power.

If increased top speed is not required, it would be possible to make the machine with somewhat lower h.p.—say 500. Assuming that the weight per h.p. and the fuel consumption per h.p. hour remain constant, the weight saved by this reduction of power would be 250 lbs. on the power plant and 200 lbs. on the weight of fuel for 4 hours—another 450 lbs. in all.

As a result of this saving, further reduction in the wing surface and tail area could be made, with a further saving in structure weight.

On this basis, adhering to the same general arrangements as in Figs. 16 and 18, a machine would be arrived at similar to Fig. 18, but of only 48 ft. 6 ins. span (top plane) and 37 ft. span (lower plane), and about 34 ft. long over all, with a total surface of 600 sq. ft., and an empty weight of 3,450 lbs., which, with 1,200 lbs. of mails and 1,050 lbs of fuel and crew of two, would bring the full load weight to 6,150 lbs.

This gives a loading of 10.25 lbs. per sq. ft. and of 12.3 lbs. per h.p.

On these figures the original specification of a landing speed of 45 m.h.p. and a maximum speed of 120 m.p.h. could both be attained.

In the case of either of these machines the attempt to build to the same specification in the twin-engined type of machine would lead to similar results to those which were found in the passenger-carrying type, without even so large an improvement in handiness fore and aft as would have resulted in that case, because the weights are concentrated fairly well in the mail carrier, and the extent to which the longitudinal weight distribution can be improved is accordingly reduced.

It will be seen that simply because passengers require an inordinate amount of room for their stowage, even as compared with such relatively bulky goods as mails, there is, for a machine of the size now under consideration, an increase in weight of the loaded machine from 6,150 lbs. to 7,200 lbs., or about 17 per cent., and an equivalent increase in the horse-power required for the same total useful load and the same performance.

These figures, if anything, underestimate the saving obtainable in the mail carrier, because, were one to commence the design *ab initio* of a mail-carrying machine for the outlined conditions it would probably be found profitable to attack the problem on quite different lines, and it might be found possible to still further economise in structural weight.

At the same time it is believed that the comparison between the two sets of machines, designed on as nearly as possible the same lines, will give a more vivid idea of the nature of the changes which result from the differing classes of load to be carried.

This effect will be found to hold over land machines of all sizes. It will be most important in very small machines, and will diminish in importance with increasing dimensions.

It will be of greater extent in machines carrying a light load per sq. ft. of wing surface than in those with heavy wing loading, because the increase of wing surface made necessary by the increased weight of the passenger accommodation will be greater, and therefore heavier, when light loadings are used than when heavily loaded wings can be used.

The disadvantages of the passenger-carrying class of machine will be greatly reduced in the case of flying boats, since the dimensions of the hull are fixed by considerations quite other than that of the nature of the load to be carried, and there will always be ample room therein for any weight of passengers which could be carried by the machine. Even in this class of machine the weight of seating arrangements and of glass look-out panels, etc., for the passengers may be an appreciable item.

With the conventional type of float seaplane the nature of the effect of the different types of load would be much as in land machines, since it is improbable that the Post Office would consent to mails being carried in compartments in the floats. Purely from the aeroplane point of view, there would be no serious objection to goods carried in this position, particularly if they were enclosed in water-tight cases of their own.

Were this arrangement adopted, the difference in favour of a cargo of a compact type as compared with passengers would be even greater than in the land machine, since, owing to the large reserve of buoyancy necessary in the floats, there would always be space in them for any load the machine could carry unless it were of very low specific gravity. Passengers could not be stowed in floats unless they were lying down.

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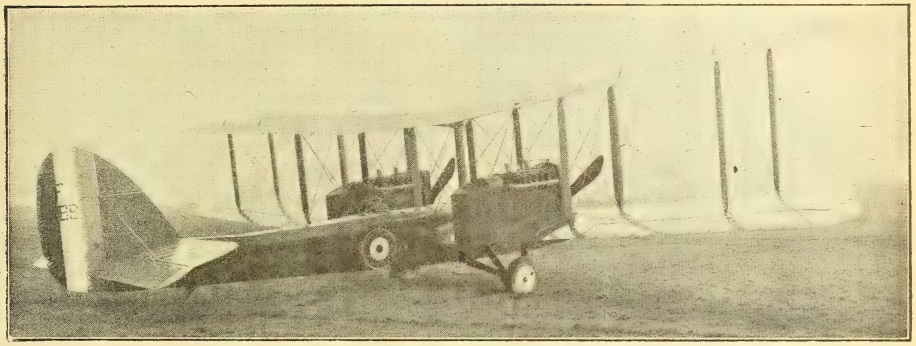
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Three-quarter View from Aft—the DeH.10A (2 400-h.p. Liberty Engines).

THE AIRCO DE H.10 AND 10A.

The De H.10 was designed as a high-speed day bomber and made its first appearance towards the end of 1917. As has been already stated, it is essentially a development of the De H.3, from which it differs in that whereas the De H.3 was fitted with pusher airscrews, the De H.10 has tractor airscrews.

The most noticeable feature of this machine is the extremely low position of the fuselage, which is mainly below the bottom wing, and the curious mounting of the engines, overhung from one side of the outer centre section struts.

The De H.10A is a somewhat later type of the same machine. They differ mainly in that in the De H.10 the twin engines are mounted well up in the gap between the planes, and in the De H10a, the engine nacelles are actually on the bottom plane.

The alterations have resulted in a very marked increase in the speed of the type 10a, accompanied by an increase in the empty weight of the machine of nearly 140 lbs.

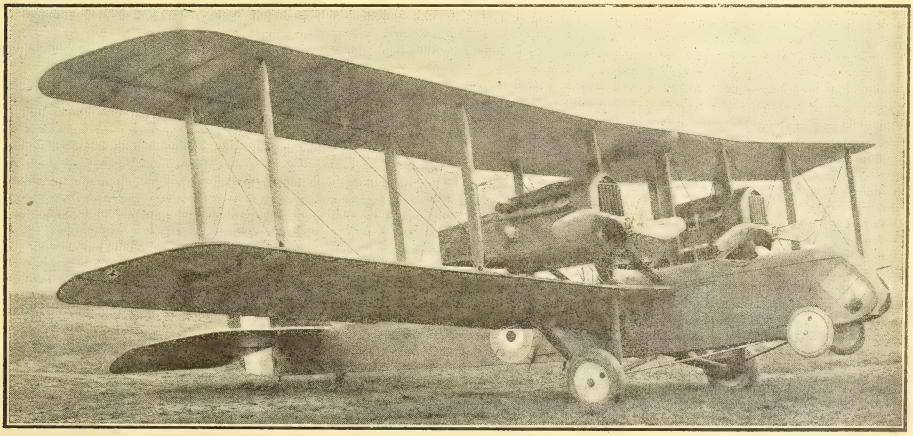
Both types proved their qualities on active service, before the cessation of hostilities, and it may be expected that with suitable modifications they will show their value even more fully as commercial machines in the near future.

SPECIFICATION.

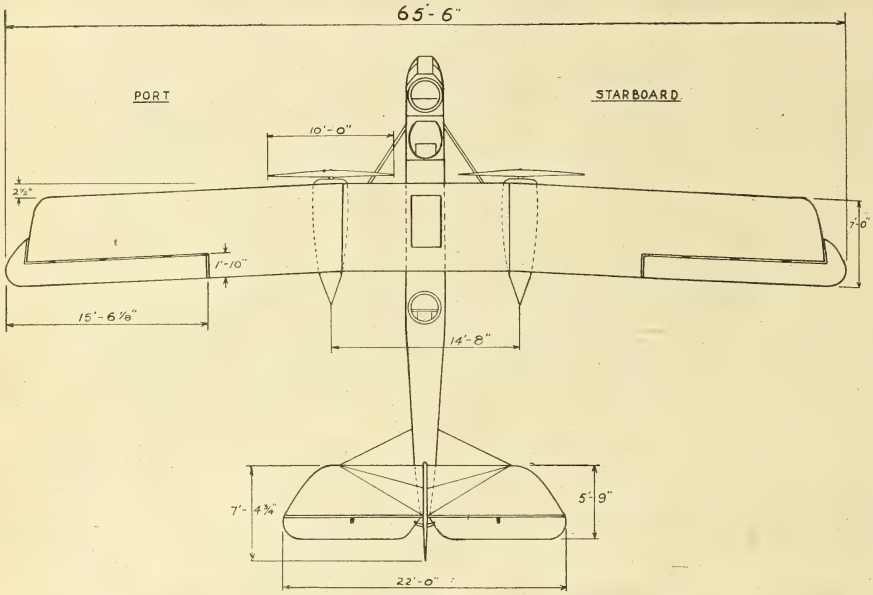
Type of machine	Biplane "Tractor."
Name or type No. of machine	De H.10.
Span	65 ft. 6 ins.
Gap, maximum and minimum	7 ft.
Overall length	39 ft. 7 7-16 ins.
Chord	7 ft.
Total surface of wings, including centre plane and ailerons	837.4 sq. ft.
Span of tail	22 ft.
Total area of tail	144.3 sq. ft.
Area of elevators	16.54 sq. ft. each.
Area of rudder	25.75 sq. ft.
Area of fin	10.0 sq. ft.
Area of each aileron	29.5 sq. ft.
Engine type and h.p.	Two 400 h.p. Liberty.
Airscrew, diam., pitch and revs.	10.0 dia., 7.3 pitch, 1,625 revs.
Weight of machine empty	5,355 lbs.
Weight of machine full load	8,500 lbs.
Weight per h.p. full load	10.6 lbs.
Tank capacity in gallons	215 gallons
PERFORMANCE—	
Speed low down	117½ m.p.h.
Speed at 10,000 feet	115 m.p.h.
Speed at 15,000 feet	110 m.p.h.
Landing speed	62 m.p.h.
Disposable load apart from fuel	1,381 lbs.

THE AIRCO DE H.10A.

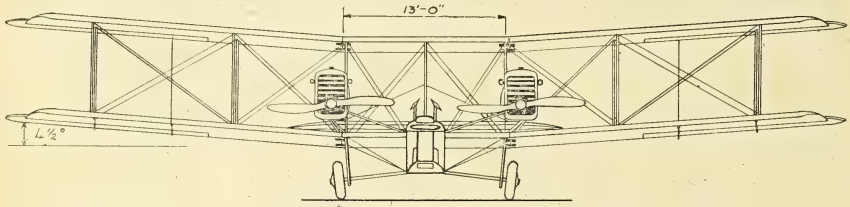
Type of machine	Biplane "Tractor."
Name or type No. of machine	De H.10a.
Span	65 ft. 6 ins.



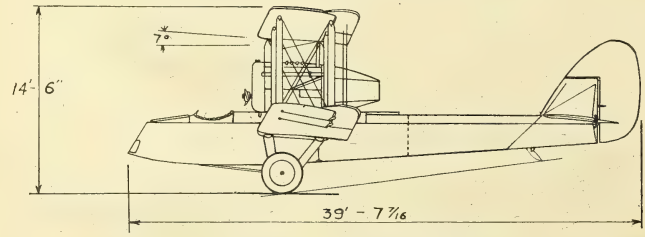
Three-quarter Front View, The Airco DeH.10 (2 Rolls-Royce "Eagle" Engines, each 360 h.p.).



PLAN.



FRONT ELEVATION



SIDE ELEVATION

DE H — 10.

FORD JONES. 19

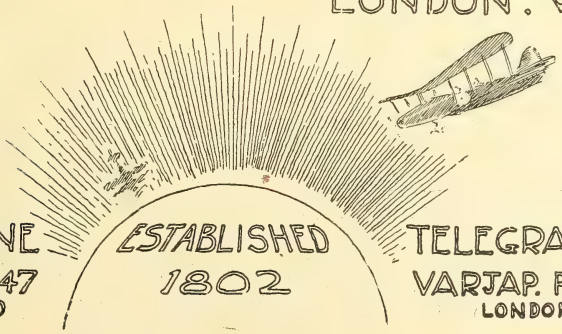
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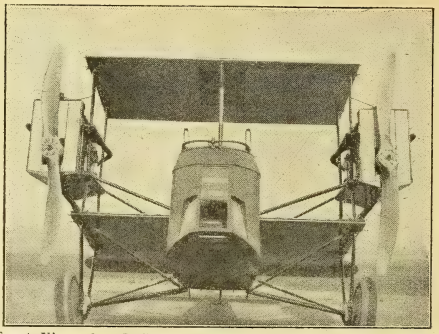


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Overall length	39 ft. 7 7-16 ins.
Maximum height	14 ft. 6 ins.
Chord	7 ft.
Total surface of wings, including centre plane and ailerons	837.4 sq. ft.
Span of tail	22 ft.
Total area of tail.....	144.3 sq. ft.
Area of elevators	16.54 sq. ft. each.
Area of rudder	25.75 sq. ft.
Area of fin	10.0 sq. ft.
Area of each aileron	29.5 sq. ft.
Engine type and h.p.	Two 400 h.p. Liberty.
Airscrew, diam., pitch and revs.	10.0 dia., 7.3 pitch, 1,625 revs.
Weight of machine empty	5,488 lbs.
Weight of machine full load ...	8,560 lbs.
Weight per h.p. full load	10.6 lbs.
Tank capacity in gallons	215 gallons.
Performance—	
Speed low down	128 m.p.h.
Speed at 10,000 feet	124 m.p.h.
Speed at 15,000 feet	117 m.p.h.
Landing speed	62 m.p.h.
Disposable load apart from fuel	1,248 lbs.



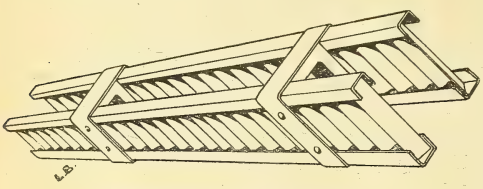
Front View of a DeH.10 (2 400-h.p. Liberty Engines) without Wings.

THE HISTORY OF THE STEEL WING COMPANY.

As was stated in a previous note (May 14th, 1919), the history of the development of the all-metal wings by the Steel Wing Company is of considerable interest, and by the courtesy of Mr. D. T. Mooney, the managing director of the firm, it is now possible to supplement that note by the following further particulars.

The whole of this firm's work has been based upon the use of spars built up of steel strip, of a thickness varying between 0.011 in. and 0.022 in., and upon the use of longitudinal corrugations in one form or another, to stiffen the flanges against local buckling.

The history of the enterprise dates back to 1909, and is based upon the work of Mr. J. Mayro, whose early patents are worked under licence by the Steel Wing Co. The firm still have in their possession an example of a steel spar built in 1912.



The Steel Wing Co.'s 1912 Steel Spar.

A sketch of this spar is given. In this case the longitudinal corrugations take the form of trough section strips, four in all, forming the flanges of a pair of I beams. The webs of each of these I's consist of another steel strip with short pitched vertical corrugations, of a depth equal to the inside width of the trough sections. The two I's are held together at intervals by rivets through a strap surrounding the whole spar, with an internal distance piece of aluminium between them.

In October, 1915, the R.F.C. urgently needed all-metal wing structures for use in the tropics, but the Metal Wing Company found it impossible to obtain supplies of suitable steel strip, and therefore turned their attention to the use of aluminium alloy.

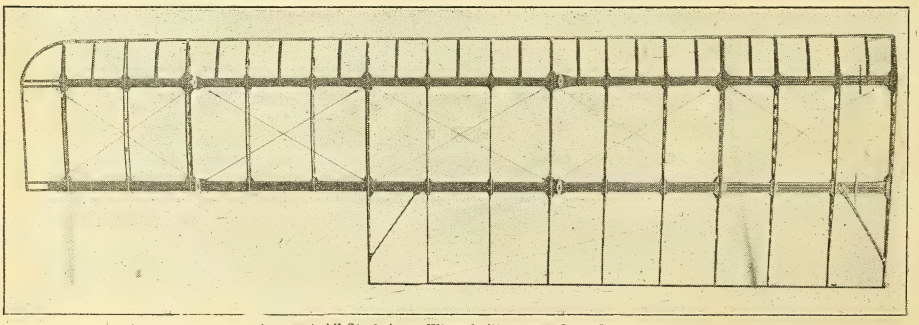
During 1916-17 they manufactured hundreds of ailerons built of corrugated alloy strip. These ailerons were lighter than wooden ones, and were up to strength requirements. They were used with completely satisfactory results under war conditions in the tropics and elsewhere.

In the meantime the firm made exhaustive tests of various types of steel, and, with the able assistance of Mr. Mackinder, of the well-known Sheffield steel makers, Kayser, Ellison and Co., Ltd., finally (early in 1917) obtained strip steel suitable for the manipulation necessary to produce the corrugated sections required.

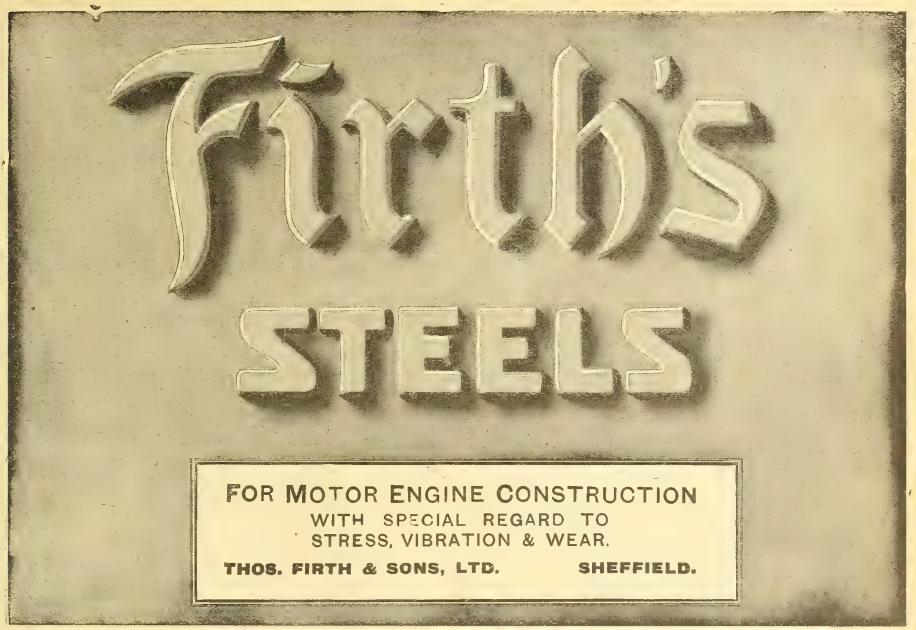
Once the right class of steel was hit upon the manufacturers rapidly improved its qualities, and they can now supply an almost ideal material for this particular work.

In May, 1917, the Steel Wing Company produced an all-metal wing for a B.E.2E., which, when tested at the Royal Aircraft Establishment at Farnborough, gave such promising results that the Department of Military Aeronautics asked the firm to manufacture a large number of steel wings for the B.E.2D type.

The complete B.E.2E wing was illustrated in the previous note, but a sketch showing the construction of these spars is given on the next page. In this case the spar is not all steel, as the double corrugated webs are of aluminium alloy. The top and bottom flanges and the rivets only were of steel.



A recent All-Steel Avro Wing built by the Steel Wing Co.



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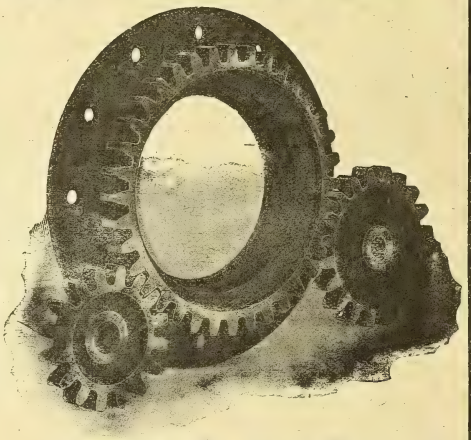
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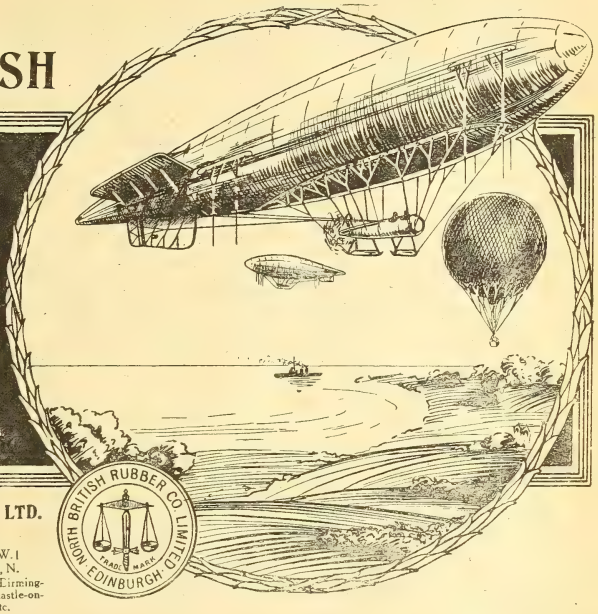
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Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Avidiction, 'Phone, London" Hampstead 4403 & 4404.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Aeros, Richmond." Richmond 1681.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England "Thomtson Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 4046.

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London" Gerrard 280.

Cellon, Ltd., 22, Cork Street, London, W.1 "Ajawb, Reg, London." Gerrard 440.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries" Dumfries 281-282.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1910.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London" Gerrard 8926.

Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1. "Rolhead, London." Gerrard 1654-5-6.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 985.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Eleven-fold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames." Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1984.

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London." Willesden 2480.

Electric Cables—

E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 24X.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W. "Installing, Eusroad." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines)

Flare Lights—

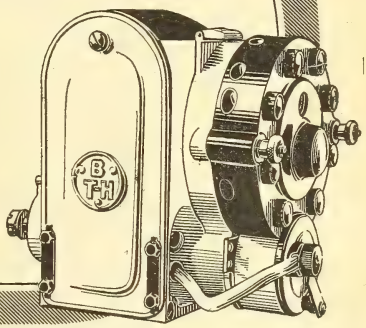
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

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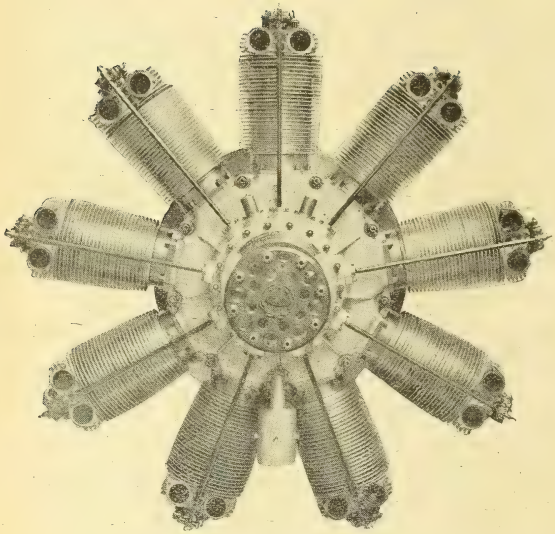
10,000 FEET IN 5 M

COS

ENGINEERING

ENG

FOR AI



9 Cylinder 450 H.P. JUPITUR.
Total weight 662 lbs.

EXTRACT FROM LETTER FROM TECHN
OFFICIAL CORRECTED BAROGRAP
BRISTOL SCOUT
"THE BEST CLIMB TO 10,000
AND TO 20,000 FEET 16 MINUTES 15

CONSTITUTING

SUPREME IN

TRADE

THE COSMOS EN
FISHPOND

TELEGRAMS:
COSMOS, FISHPONDS

SALES DEPT.
16 & 17 P
TELEPHONE

20,000 FEET IN 16 M

NUTES 25 SECONDS

MOS

OMPANY LTD.

INES

RAFT

DEPT. OF THE AIR BOARD GIVING IGURES OF MERCURY ENGINE IN FARNBOROUGH.

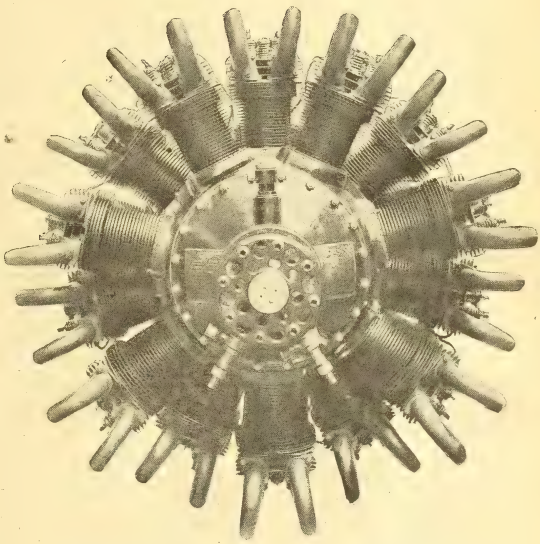
ET WAS 5 MINUTES 25 SECONDS CONDS; SPEED at 10,000, 143 M.P.H."

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POWER FOR WEIGHT

MARK



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Total weight 587 lbs.

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. MALL, W
76 REGENT

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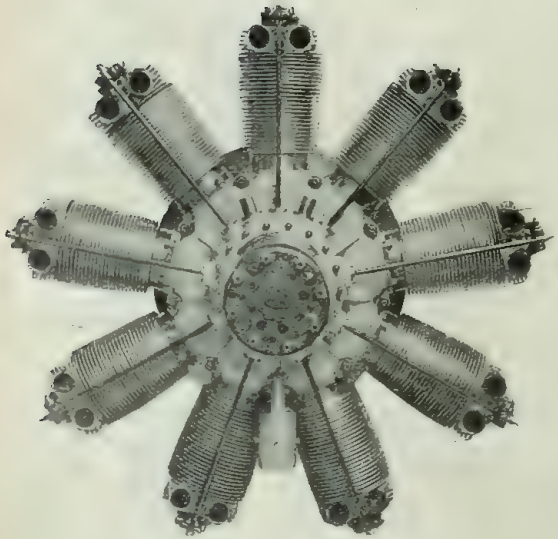
10,000 FEET IN 5 MINUTES 25 SECONDS

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ENGINEERING COMPANY LTD.

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FOR AIRCRAFT



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Total weight 662 lbs.

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TELEPHONE: 476 REGENT



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Fluxes—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).
The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.
Voucher Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

Glue—
Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Beecoglin, Cannon, London." City 1266.
Improved Liquid Glues Co., Ltd., 61, Hermitage Street, E. (Croid.) "Excroiden, 'Phone, London." Avenue 4611-2.
Meudine Co., 8, Arthur Street, E.C. Bank 5873.

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Heating and Ventilating—
Chas. P. Kinnell and Co., Ltd., 65 & 65A, Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 703.

Instruments—
British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Ancroid, Phone, London." Walthamstow 180.

Insurance—
Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 9944.
Bray, Gibb & Co., Ltd., 166, Piccadilly, W.1.
S. Sackville & Sons, Duchy Chambers, 4, Clarence Street, Manchester.
Harold Townend, Ltd., 13-14, Abchurch Lane, King William Street, E.C.4. "Carinsur, London." Central 156 (2 lines).
Percy Wingfield, 22, Newgate Street, E.C.1. City 4672.

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London. "Pegamoid, Cent., London." City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—
W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines.)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 430.
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asteroidal, Coventry." Coventry 278.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 999 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—
Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., 61, Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 470.
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsaero, Phone, London." Regent 1181.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros, Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham." Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115.

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Eusroad, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—
C. C. Wakefield & Co., Ltd, Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London" Central 11305 & 13466.

Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)
C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames "Ebora, Kingston." Kingston 672.
Integral Propeller Co., Ltd., "Aviprop, Hyde, London." Hendon 9. Kingsbury 104
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 20.

Rawhide Hammers—
Ira Stephens, Whitelands Leather Works, Ashton under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 & 3812.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10 "Rodynalite, Phone, London." Willesden 2480

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830
British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsaero, Phone, London." Regent 1181.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

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Solder Manufacturers—

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Sparking Plugs—

Brown Bros., Ltd., Great Eastern St., E.C.1
Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 233.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Roffinhood Engineering Works, Ltd., 5 Newlands, Putney Vale, S.W.15. Makers of KLG Plugs. "Kaelgee, Phone, London." Putney 2132-3.

Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines)

Steel—

Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield." Central 4522-3-4.

Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Tapes and Smallwares—

MacLennan, John, & Co., 20, Newgate Street, E.C.1, And at Glasgow. City 1115.
C. E. Matthews & Co., Ltd., Castle Works, Bermondsey Square, S.E.1. "Webbance, Berm, London." Hop 4028.

Timber—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London." Museum 496. Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Time Recorders—

Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—

Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349.

Turnbuckles—

Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery Owen & Co., Darlaston, South Staffs.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston road." Museum 70 (4 lines).

Tyres and Wheels—

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Central 3880 (5 lines).
The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Varnishes—

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjap, Phone, London." Mayfair 6347 (5 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—

Terry, Herbert, & Sons, Ltd, Redditch. "Springs, Redditch." Redditch 61.

Welding and Cutting Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London" Vic 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Welding Repairs—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac," Phone, London." Victoria 3540 (3 lines).

Wind Shields—

Auster, Ltd., 133, Long Acre, W.C. "Windfector, London." Regent 5010.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London" Willesden 2480.
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterbys, Piccy, London." Regent 1340.

Wire Gauze—

Greening, N., & Sons, Ltd, 16, Finsbury Street, London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.

Wire and Cables—

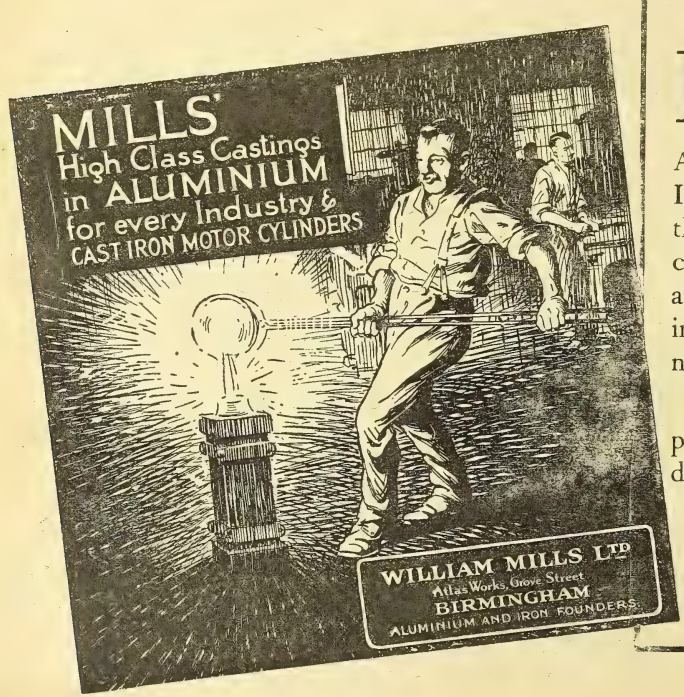
Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

Wirework—

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Woodworking Machinery—

Robinson, Thomas, & Son, Ltd., Rochdale, "Robinson, Rochdale." Rochdale 367.
Sagar, J., & Co., Ltd., Halifax. "Sawtooth," Halifax." Halifax 136.
Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.



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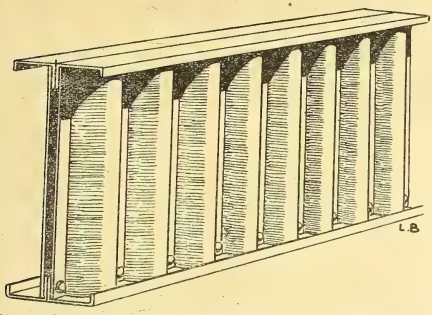
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Sketch of the construction of the 1917 Steel and Aluminium Alloy B.E.2E Spar.

The specification for these wings called for a further improvement in the steel used, but this difficulty was speedily overcome, and in October, 1917, a complete B.E.2D. wing had been produced.

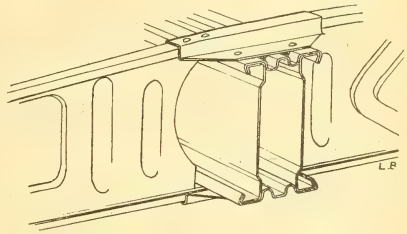
Just as this type of wing was going into production an urgent instruction was issued to the firm to produce all-steel wings for the Bristol all-metal M.R.1 type. These wings were ready within a few weeks and were tested officially in April, 1918.

At the end of February, 1918, the Technical Department of the Department of Aircraft Production formed a Metal Design section, under the charge of Lieut. (now Capt., R.A.F.) A. P. Thurstan, R.N.V.R., one of whose earliest activities was to institute a kind of competition for the design of metal wings for the Standard Avro training machines.

At the date of the Armistice quite a number of firms had submitted sample steel wing spars for the Avro, for this competition, but, so far as is known, no other firm had produced an all-steel Avro wing.

At an early stage in the revival of interest in metal construction the Steel Wing Co. had considered, made and tested spars employing tubular type booms, but these were abandoned because of the difficulties of attaching metal ribs to them.

All the spars actually used by this firm were designed to simplify such rib attachments and to facilitate erection and replacement. This difficulty has been very neatly solved by the use of saddle-plates, which bridge the spar and carry the separate sections of the ribs. The method is clearly shown in a sketch, and in a photograph of the unassembled portions of a rib which are reproduced.

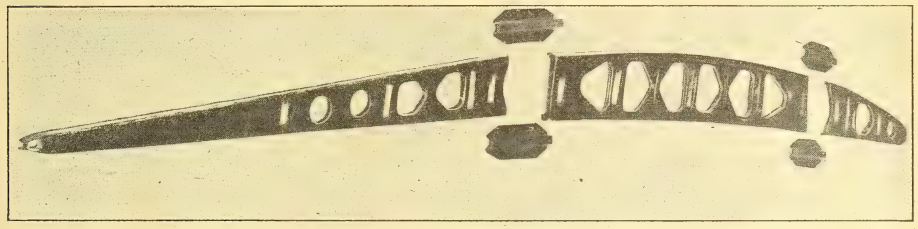


Sketch showing the simple Saddle-plate Method of attaching Steel Ribs to the Spar.

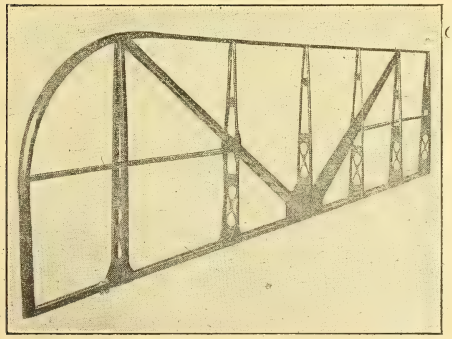
The first type of Avro wing produced by the Steel Wing Company when sand loaded, stood up to 9 times normal load without failure of the wings, and they were as light as the average wooden wings.

This type has been tested under flying conditions and has given complete satisfaction.

Since the Armistice two further improved types of Avro wing have been produced which are even lighter and stronger than the original type above referred to.



Photograph of an All-Steel Avro Rib and Saddle-plates. The Steel Wing Company.



An All-Steel Avro Aileron built by the Steel Wing Co.

ALL-METAL CONSTRUCTION.

Sir,—We notice in your issue of May 7th a statement by Mr. J. D. North, of Messrs. Boulton and Paul, to the effect that corrugated steel spars are liable to fail in secondary, and that in order to meet that tendency it will be necessary to make them somewhat heavier than wood.

This company has been for some years producing all-metal wings. We have—amongst others—produced wings for type Avro 504K. machine, which are lighter than the average wooden wings at present in use for that type of machine. These wings are satisfactory under flight conditions, and have been submitted to official static tests which showed a strength factor considerably greater than that required for wooden structures of the type. There was no failure of any part of the wing structure proper under such a load, the test in each case had to be discontinued owing to the failure of standard fittings which, owing to the greater strength of the steel wing structure, had apparently been tested beyond their designed strength.

There were, as Mr. North supposes, very considerable structural and other difficulties to be overcome before steel construction reached the stage indicated above.

Yours faithfully,

THE STEEL WING COMPANY, LIMITED.

[It should be noted that the writer of this letter has apparently misunderstood Mr. North's statement. Mr. North said that the difficulty as to secondary failure could be overcome by corrugation at a slight increase of weight, i.e., at a slight increase as compared with the uncorrugated spar.—Ed.]



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THE METAL CONSTRUCTION OF AIRCRAFT.

The paper under the above title, read by Capt. A. P. Thurston, D.S.C., F.R.Ae.S., F.R.Met.S., M.I.A.E., late R.A.F., before the Royal Aeronautical Society on Wednesday last, May 14th, attracted a very numerous gathering.

Unfortunately the reading of the paper occupied so long a time that only a very few members were able to speak in the discussion.

The following is an abstract of the paper :—

This war has been fought with machines made of wood, a most unsatisfactory material from a constructional point of view. Wood warps and cracks; is unsuitable for tropical climates; splinters easily in a crash; is liable to transfix the aviators; is non homogeneous; uncertain in strength and weight; weakens rapidly when exposed to moisture; and is not produced in any quantity in this country.

On the other hand, metal does not splinter; it is much safer in a crash, the members hanging together and forming a shield to protect the aviators; its properties are known to a fine degree and may be relied upon; it can be produced in immense quantities; and, moreover, metal members after failure can still carry a considerable load.

A year ago over 1,000 all-metal machines had been used with success in the allied fighting line, but not one had been made in this country. Had the war extended into this year, however, a prodigious number of machines, made of steel and duralumin, would have been produced. The armistice stopped this.

It will probably taken ten or more years now before metal construction will have reached the stage of development that it would have reached in ten months under war conditions.

The advantages of metal construction are not confined to greater strength, lightness, reliability, and ultimate cheapness. Its use will enable many new developments to be made in the actual design of aircraft.

Heretofore, with a few notable exceptions, the vital members of the aircraft structure have been made of wood. The weight and strength of specimens from the same species differ greatly. Spars for one type of machine were found to vary in weight from 6½ lbs. to 16 lbs., and the strength varied in practically the same proportion. In addition, the strength decreases with the amount of moisture absorbed. Thus, the strength of spruce in compression decreases 230 lbs. per sq. inch per 1 per cent. of moisture between 10 per cent. and 25 per cent. moisture. Wooden machines sand tested under the very favourable conditions of a dry workshop therefore showed a much greater strength than in the field. A sodden machine in the tropics may have only half the strength of the same machine when tested in the workshop at home. Moreover, owing to the disposition of wood to warp or split, particularly under tropical conditions, a wooden machine quickly gets out of truth and requires trueing up. Wooden wings deflect a great deal under load, thus making it impossible to keep all portions at an efficient angle of incidence. For instance, in a single bay wooden machine under load it was found that the angle of incidence changed 1° under the struts, while in the middle of the bay the angle of incidence changed 2½ per cent. As this machine flew with an angle of incidence of not more than 1° it follows that some parts of the wing were lifting much more than other parts; moreover, the maximum loads were applied in the least favourable place, namely, in the middle of the bay.

At no distant date we may expect to see flying machines of not less than 100,000 to 200,000 lbs. and metal is the only substance from which such machines can be satisfactorily constructed. Metal machines have now been thoroughly tested in the air. They have been spun, rolled and looped and sand tested.

BASIC PRINCIPLES.

The metals which are immediately available for metal construction are steel and duralumin, other alloys should be available shortly.

The specific gravity of good dry spruce, grade A equals 0.45; the specific gravity of steel equals 7.8; the specific gravity of duralumin equals 2.7.

Young's modulus in bending for all steels approx., equals 13,600 tons sq. in.; duralumin, 5,500; spruce, A, 715. Hence, steel is 17 times heavier than good spruce, and duralumin is 6.

The strength of spruce in bending cannot be assumed greater than 5,500 lbs. sq. in. or 2.45 tons sq. in.

Hence, steel of 42 tons per sq. inch or duralumin of 14.7 tons per sq. inch are equal in pure bending, weight for weight, to grade A spruce, providing the full strength of the material can be developed.

The strength of a long strut or spar under combined bending and end load is governed by the modulus of elasticity

It follows that steel struts are, weight for weight, 1.1 times as strong as spruce, and that duralumin struts are 1.28 times as strong as spruce, provided the full strength of the metal is developed. These figures relate to the best wood obtainable under peace conditions, but they are much more favourable to metal when compared with wood available under war conditions.

Metal construction has the further advantage that the metal may be disposed at a greater average distance from the neutral axis.

It may be argued, since the modulus of elasticity of all grades of steel is approximately the same, that the grade of steel to be used in struts is of no importance. This is not so, because with mild steels small local damage causes failure, whereas with higher grade steel local damage is of minor importance.

LOCAL FAILURE.

The metal used in the construction of metal aeroplanes must be extremely thin if it is to compete in weight with wood. The most useful thicknesses for steel have been found to be 0.015 in., 0.018 in. and 0.022 in.

Duralumin has the advantage over steel in that it is three times thicker, weight for weight. The chief difficulty with thin metal structures is local failure due to local flexure before the full strength of the material has been developed.

A preliminary series of tests were made by Major Wylie on square tubes having flat sides 1⅛ in. wide which was fifty times the thickness of the metal. The tube was heat treated to raise the elastic limit to above 80 tons per square inch, but when tested by bending the side in compression formed transverse corrugations at 25 tons per square inch, and these corrugations increased with increasing load, and finally caused failure at a stress of about 40 tons per square inch.

When tested in compression the tube failed completely at about 25 tons per square inch as soon as the corrugations appeared.

Further tests on circular tubes of the same thickness and of diameters varying from 1⅛ in. up to over 2 ins. were also made, and in all cases the circular tubes developed the full strength of the material. It is evident, therefore, that curved surfaces must be used instead of flat surfaces.

MATERIALS. STEEL STRIP.

Thin steel strip is produced by cold rolling, as it is not economical to roll the material hot to less than 17 or 18 gauge.

The hot rolled strip is usually first pickled and then cold rolled to the thickness desired. As the metal is reduced in thickness it is hardened, and the tensile strength and yield point increased, and a point may be reached where the hardness is so great that it must be removed by annealing before further reduction.

By cold rolling a 0.3 to 0.35 per cent. carbon steel the tensile strength and yield point may be increased up to about 65 tons per square inch with practically no ductility.

If, however, the strip is tempered or "blued" for 15 or 20 minutes at a suitable temperature, the ductility may be increased to any desired amount according to the temperature, and the maximum breaking stress and yield point do not fall to that of the original cold worked figures until a temperature of 425 degs. to 450 degs. C. is reached.

One process of manufacture is, therefore, by cold rolling and "blueing" simple carbon steels. The process of rolling develops a grain in the material which cannot be removed even by complete annealing; strip steel is, therefore, unsuitable for bending or rolling into sharp angles and all strip steel designs should be formed of easy and continuous curves or corrugations. This is a second reason for longitudinal corrugations in design.

A second process of manufacturing steel strip is by continuous quenching and annealing low and medium carbon steel strip.

The third process, which has yielded excellent results, has been developed by Messrs. Kayser, Ellison and Co., Ltd. This process consists in hardening and tempering by a special process alloy steel strip. The resulting product is scoured by a special process and can be welded, punched, rolled and bent longitudinally and laterally without further heat treatment.

It is a pleasure to pay a tribute to the patriotic way in which Mr. Kayser, of Kayser, Ellison and Co., Ltd., together with the associated firms of Arthur Lee and Co., Ltd., and The Effingham Steel Co., and other manufacturers of Sheffield and district have tackled and solved successfully the problem of the evolution of metal strip suitable for aircraft construction.

The strength of metal constructions appears to be governed more by the yield point than by the ultimate strength, hence attention should be paid to obtaining a good yield point. Straight steel strip can now be obtained up to 5 in. wide, having yield points of 100 tons, 80 tons, 60 tons, or 40 tons.

DURALUMIN.

The second material available for metal construction is duralumin. This has many advantages over steel and a few disadvantages. Duralumin being three times lighter than steel it follows that the various members may be, weight for weight, three times thicker than steel members. Hence the difficulty in overcoming local failure due to local flexure is greatly reduced.

A prejudice appears to exist in certain quarters against duralumin owing to the fear of corrosion. Nearly every case of corrosion so far experienced in actual practice has been traced back to incorrect heat treatment, or to cold working after heat treatment.

The heat treatment of duralumin instead of being a disadvantage as is often supposed, is in actual point of fact of the greatest assistance in the practical working of the metal. This heat treatment is carried out by placing the member to be treated in a bath containing a mixture of potassium and sodium nitrates heated to a

temperature of 480 degrees C. In practice there is a fairly wide margin of temperature so long as 500 degrees C is not exceeded. At the end of this heating the article is removed from the bath and quenched out in water or non-acid oil.

Immediately after heat treatment the metal is found to be in a very soft and plastic condition and it may be pressed, forged, bent to the smallest radius, or in the case of warped sections straightened without any fear of damaging the metal. The metal now commences of itself to harden up, and in about an hour's time has reached about 26 tons tensile strength, with an elongation of about 15 per cent.

This process of hardening continues for a very long period, the strength slightly increasing at the expense of the elongation.

Heating duralumin to 300 degrees C. and then quenching out anneals the metal and it can be worked in any way desired. In order to give it back its strength it is necessary to heat treat it.

In practice it is usual to anneal any duralumin part if a number of operations have to be performed, and on the other hand to heat treat before final operation if this is not of too prolonged a nature, taking advantage of its abnormal condition immediately after heat treatment.

An actual example of the value of this property of duralumin in slowly hardening up after treatment occurs when duralumin is used for rivets. If an attempt were made to rivet these up in the ordinary hard condition they would crack badly. By heat treating them, however, and using them immediately after this, a perfect job may be made while they are soft, and within a very short time afterwards they have hardened up to their full strength.

If duralumin in the ordinary hard condition is bent to a small radius, there is a probability of incipient cracks developing on the surface of the metal at the bend. These cracks are the places where the corrosion begins. If the metal was properly heat treated before such bending, no injury would be caused to the surface of the metal, and no trouble would be experienced from corrosion. Duralumin sections cannot conveniently be drawn thicker than 0.2 in. Above this thickness the sections are extruded. It is advisable to use only drawn sections for constructional purposes.

Constructional Designs.

The structure of an aeroplane may be divided into two main portions: (a) The vital members, such as spars, struts, longerons and lift wires, and (b) the members giving form or bulk, such as ribs, ailerons, elevators, etc. The latter members present no great difficulty in competing with wood.

Metal designs are required for three main types of machine: (a) Small machines up to 3,000 lbs.; (b) intermediate machines from 10,000 to 15,000 lbs.; and (c) large machines of from 30,000 to 200,000 lbs.

The largest members in a machine are the wing spars and these present the greatest difficulties in construction—the next largest members are the struts. In this paper it is proposed to limit the description to these members for the above types.

Rudge Spars.

A section of the Rudge spar, developed from designs by Lieutenant-Commander H. Wylie, and suitable for the Avro machine, is shown in Fig. 1

In this spar an effective strength of 80 tons per square inch in the strut is utilised. To prevent local failure the strips have been formed into longitudinal corrugations, the radius of each corrugation being from 30 to 100 times the thickness of the metal, a smaller radius being used when the highest compressive stresses are to be withstood. These corrugations are so effective that the Rudge spar shown has developed a compressive stress of 83 tons per square inch in the flange, while the webs have remained intact under a shear stress of about 30 tons per square inch.

When tested at the Royal Aircraft Establishment it was found that this spar was ten per cent. lighter and 5 per cent. stronger than the wooden spar it was designed to replace.

Fig. 4 shows a modification of the Rudge spar for intermediate type machines.

The first step is to deepen the central corrugations in the webs so that they meet together, thus forming the section into two tubular units. Each web is formed of two pieces joined together at the neutral line. This is necessary in view of the limited width of strip available. The free ends of the flange are turned inwards so that the maximum stress is not developed at the free edge. This considerably increases the strength of the flange.

The best disposition of the free ends of the strip constitutes one of the problems of metal construction. The solution lies in placing the free ends in position where they will be stressed as little as possible. Failing this they must be locally supported.

Fig. 3 shows a modification of the Rudge spar for a larger machine.

With this type of spar the metal must be increased in thickness to retain sufficient stability. These sections are obviously weak about the waist and support must be given by cross frames, or formers, which suitably occur at each rib. With the addition of these frames the section is made stiff in all directions even when the strip composing it is of extreme thinness relative to its width. The flanges are supported in the middle by extending the web into contact with the inner surface.

Fig. 2 shows a modification of Fig. 1. The depth of the spar may be readily altered by varying the depth of the central corrugations of the webs, the minimum depth being obtained where the corrugations meet in the centre. In the event of the corrugations not meeting as in Fig. 4, it is necessary to join the webs together at intervals by a cross tubular member riveted to each.

Dunlop Spars.

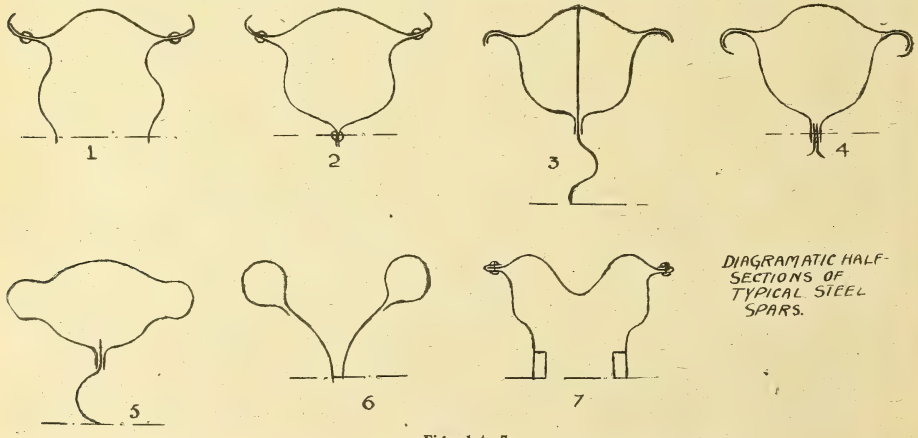
Several designs have been adopted to utilise spot or strip welding—this dispenses with the difficult, and at present somewhat expensive, process of riveting.

One such design, known as the Dunlop single spar, is shown in Fig. 5.

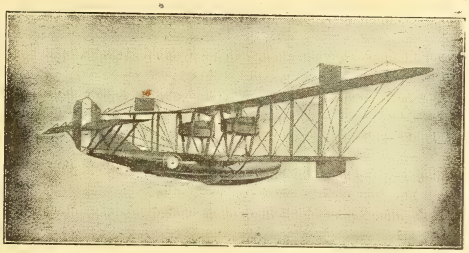
Three coils of strip of the required width are mounted on the rolling machine. After passing through the banks of rolls each strip emerges of the required shape and passes through guides which hold the strips while they are passed between two pairs of copper discs at the joints, a powerful current passes from one disc to the other through the steel strip. The resistance offered by the strip to the passage of this current is sufficient to raise the strip to welding temperature. The spar emerges complete from the machine at the rate of 9 feet per minute.

One great advantage of the Dunlop type of boom is the absence of the projecting ledges provided on the previous spars for connecting the component strips together. These ledges are liable to buckle when high longitudinal compression stresses are developed even if they be curved throughout and rolled round on the edges.

Fig. 6 illustrates a section known as the double Dunlop spar. The edges of two strips are rolled into tubes and strip welded, the intermediate portions of the strip being longitudinally corrugated. The formed strips are placed back to back and connected together



Figs. 1 to 7.



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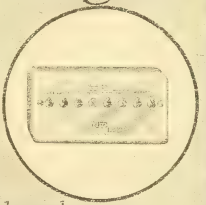
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by spot welding. This spar is in effect two bicycle rims placed back to back and connected together at the centre. As with the Dunlop single spar, it requires to be supported by frames or formers at intervals to prevent the individual booms from bending as struts transverse to the web.

This spar can be made as light as 0.5 lbs. per foot run and develops the same strength as a wooden spar of from 0.65 to 0.85 lbs. per foot run. This type of construction is the cheapest and simplest yet developed.

In the spar designs shown the strips run continuously throughout, no holes being cut to lighten the sections. This continuity is a feature and has great advantages, for it has been found in tests that destroying the continuity weakens the spar considerably. Lightness can be obtained with less sacrifice of strength by reducing the thickness and increasing the curvature of sections. From experience it would appear that spars with continuous webs can be made as light as with any system of trussing.

A second feature in the Dunlop designs is the absence of rivets and other means of connection along the lines of maximum stress.

Methods of Attaching Fittings.

Another problem of metal construction, presenting in fact almost as much difficulty as the actual design, is the attachment and design of fittings. Fittings and reinforcements are required whenever a load is applied in order to distribute that load. Thus, spars should be reinforced with boxes at the inner ends to distribute local bending moment due to inequalities of end loading. In addition, all fittings should preferably be attached to the neutral line.

Boulton and Paul Spars.

Very interesting experiments have been carried out by Boulton and Paul with a modified type of Ridge spar shown in Fig. 7.

The flange is provided with two corrugations having flat horizontal edges. The centre portions of the webs are stamped with flanged holes as in the early Rudge spars, and are provided with longitudinal corrugations above and below these holes. The edges of the web are doubled over to embrace the flat edges of the flanges, and the spar is completed by suitably placed rivets. This spar is extremely efficient under test.

Humber Spars.

The spars previously described have been made from rolled strip. A second alternative is to construct spars from metal sheet which can be obtained in lengths up to 10 ft from firms such as Sankey's and Firth's.

Valuable and useful work has been carried out in developing this form of construction by Colonel J. A. Cole and Mr. Nibblet, of Humber's, Ltd. An original design from which this firm's design was developed was very courteously placed at their disposal by Captain Green, of Siddeley Deasy.

The first section, Fig. 8, was made of 25 gauge 31 ton steel sheet for both flange and web. The width of the flange was two inches and a stiffening bead or longitudinal corrugation was rolled in the centre of the flange throughout its length. The web was lightened by circular holes punched on either side of a longitudinal bead or corrugation in the centre of the web and slightly smaller than in the flange. The spar was made up of four lengths joined together by staggered lap joints, three of these lengths being identical, the fourth being tapered to suit the outer extremity of the wing.

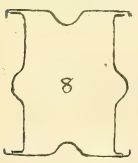
The ultimate section decided on was similar to the above, but of 35 ton steel with the flange and web of 26 gauge.

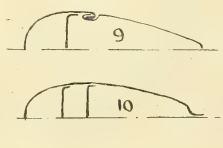
Struts.

The solution of the strut problem is much simpler than that of the metal spar.

There are several principles which must be kept in mind in tackling the problem.

If a round steel tube is used it must obviously be provided with fairing back and front, which does not contribute greatly to the strength, but adds considerably to the weight; moreover, steel tubes of high quality are expensive. If the exterior of the metal strut is to be streamline, the moment of inertia about the minor axis will be much smaller than about the major axis. This does not lead to an efficient disposition of the metal. Moreover, the front and rear edges are sharply curved and hence self-supporting, whereas the sides are only slightly curved. The principle, therefore, to strive after is the provision of more metal at the sides and rigid supports for the sides.





This problem has been very successfully solved by C. A. Llewelyn Roberts, of the Birmingham Guild, and by Messrs. Sankey. Certain other designs are stronger and lighter than the best spruce or steel tube struts.

Fig 9 shows the Birmingham Guild strut No. 4. This was designed to be constructed in two halves, the nose of the strut being designed to take the whole load. This nose was made in high tensile steel with a cross piece connected by electric spot welding.

The tail fairing was made of aluminium. The joint between the fairing and nose was made with a tinsmith's folded joint well hammered down. This strut weighed complete with end fittings 3 lbs. 1½ ozs., thus bringing the weight below that of the lightest Avro wood strut. On test, it supported a load of 0.75 tons on 66 inch centres, being 20 per cent. stronger than the Avro wood strut of nearest weight.

Fig. 10 shows Birmingham Guild strut No. 5. It is composed of three units only, a shell and two diaphrams. The production of this strut required no hand labour. The units are all blanked out and formed up in presses, being jigged together for spot welding, the whole of the electric spot welding being done in three-quarters of an hour. The actual cost of this strut in production is stated to be half that of wood. Its weight is 3.15 lbs. as against 3.25 lbs. for the wood strut. Its failing load on 69 inch ball centres is 0.77 tons as against 0.475 tons for the wooden strut.

Figures were also shown giving outline particulars of two types of streamline metal struts by the Birmingham Guild which are well suited for large machines. These were very similar to Fig. 10 in design.

These types of struts are suitable for lengths up to 25 ft. or over, and there is no limit to the load they can be designed to carry.

Hollow wooden struts made of grade A spruce are known to be unsuitable for tropical use. Moreover, for a given width, weight and length, hollow wooden struts have been found to be about 50 per cent. heavier than the double-diaphram strut described above.

A round steel tube with wood and fabric fairing is about 70 per cent. heavier than these struts. Solid drawn steel tubes of the sizes necessary for the largest machines are unobtainable.

Duralumin Machines. Vickers' Spars.

All the previous descriptions have especially related to steel constructions, but many of the constructions are suitable for duralumin. The problem of the duralumin machine of various types has been tackled successfully by Commander Craven and Messrs. Pratt and Temple, of Vickers, Ltd., starting from a suggested design courteously placed at the firm's disposal by Professor Lea, of Birmingham University.

Methods of Design and Calculation of Girder Spars.

In designing the most economical braced girder to withstand a certain definite system of loading, there are usually three points which have to be considered if the highest efficiency is to be obtained. These are :—

(a) The ratio of the over-all depth of the guide compared with its pin-jointed length. If the girder is made very deep the weight of the bracing (i.e., the web bracing—Ed) becomes excessive while, on the other hand, if made too shallow, unnecessary weight has to be put into the main flanges or members. The maximum depth of the girder is usually limited by the section of the wing.

(b) The pitch of the web bracing. If this is too great, unnecessary weight has to be put in the main flanges. If the pitch is too small the bracing is unnecessarily heavy.

(c) The properties of the actual section used for the main flanges or members. If the member is made very thin it fails at a low stress by secondary flexure, while, on the other hand, if the flanges are made very thick compared with their width, the radius of gyration for a given sectional area is necessarily small in proportion to the pitch of the bracing, and hence fails at a low stress.

The effect of varying each of the above items has been very carefully investigated and general data obtained which enables not only the strength of any particular girder to be accurately calculated, but also the girder to be so proportioned as to allow the maximum efficiency, from the point of view of strength for weight, to be obtained.

For the details of the special applications of stress calculations given by Capt. Thurstan reference should be made to the actual paper. It should be noted that all the figures given in this part of the paper appear to refer solely to duralumin spars—though this is nowhere stated in the paper.

A number of slides of duralumin spars were shown of which it has not been possible to obtain reproductions up to the time of going to press.

Photographs of a duralumin Avro wing were shown after sandloading to failure—at a load of 10.7 times the normal.

Method of Testing Specimens.

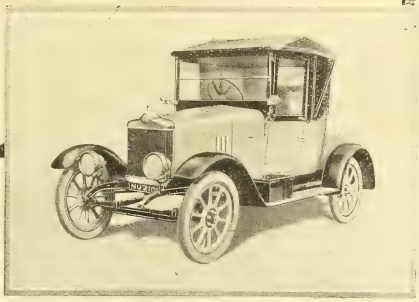
In investigating the suitability of a construction to withstand the loads which are to be put upon it care should be taken to reproduce as nearly as possible the conditions under which the specimen will be loaded in practice.

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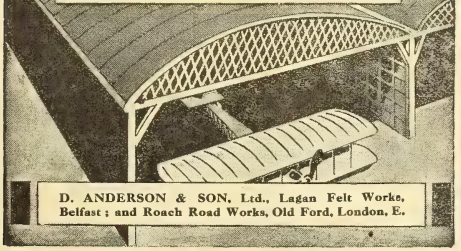
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Thus, the specimen should be subjected to the same bending moment and the end load as in practice. Reference has heretofore been made as to the serious errors which have been made in testing wooden specimens in pure bending instead of in combined bending and compression. The same errors may be made if the correct procedure is not followed in testing metal construction. In the first experimental stages of metal construction the author was unable to get certain manufacturers to construct specimens longer than three feet. Arrangements were therefore made to test these specimens in shackles. The height of the shackle was varied to give the correct proportions of end load to central bending movement.

As soon as circumstances would allow, and suitable designs had been selected from the large numbers tested, arrangements were made for the specimens to be made equal in length to the distance between the points of contraflexure in the actual span. The specimens were then tested so that the end load and the bending loads were applied in the correct ratio until failure occurred.

All this information now set forth has been obtained from private sources, but before leaving the Technical Department the author took action to place on record a much fuller account. This should now be available. He desires to record his indebtedness to General Weir and the authorities of the Air Ministry for permission to read this paper, and to tender his sincere thanks to his colleague, Major Wylie, R.A.F., who has been associated with the author in the development of metal construction throughout the country. He would also like to record his thanks to the various firms with whom he has been associated for their most courteous co-operation and for the ability and energy which they brought into requisition.

The Discussion.

After a brief request from the Chairman, Brigadier-Gen. R. K. Bagnall-Wilde, C.M.G., that speakers should be as brief in their remarks as possible, in view of the late hour, the discussion was opened by Major A. R. Low, R.A.F.

Major Low stated that he believed that he was responsible for the design of the first all-steel wing ever built in this country. This was whilst he was connected with Vickers Ltd.

The wing in question had tubular spars, and the weight thereof was enormous. It was therefore scrapped in favour of spruce construction. Messrs. Vickers in those days built a number of machines into whose construction steel entered largely. They succeeded in obtaining a supply of 45-ton steel tube for this work, but the supply ran out after the first machine.

Later, after considerable trouble, they were promised supplies of 40-ton tube, but it was necessary in practice to pass the material if it showed 37.5 tons on test, as otherwise they would have scrapped the lot. Germany at that time had ample supplies of 45-ton tube.

He believed that he had gained the reputation of having said that a machine larger than 5 tons could not be built. As a matter of fact he had not said anything of the sort. He had said that 5 tons was the limit unless the structure weights then (1912) obtained could be reduced. They had been reduced, and 15-ton machines were flying satisfactorily. If steel construction would allow the structure weight co-efficient to be reduced fourfold, as its advocates held, then the 60-ton machine would be as practicable as the 15-ton machine was to-day.

Mr. Pratt, of Vickers Ltd., said that he was primarily interested in duralumin construction. He confirmed Capt. Thurstan's statement that duralumin properly treated did not corrode. On rigid airships the actual corrosion was less than with steel under similar circumstances. Even were the actual rate of corrosion the same, since for equal weight and strength duralumin members were three times the bulk of steel, the proportionate loss in strength would be less in duralumin.

The use of duralumin was limited in its applications because riveting was the only satisfactory method of jointing. Experiments were in progress with spot welding this material, which promised success.

As to cost, although duralumin was more expensive for moderate-sized machines, he believed that for 10 tons and upwards it would actually be cheaper, certainly for large production.

Major Wylie, R.A.F., after reciprocating Capt. Thurstan's tribute to his own work, joined issue with him on the subject of the relative rigidity of steel and wood spars. He (Major Wylie) believed flexibility to be advantageous, and that it was one of the good points of steel spars. Up to the elastic limit steel spars deflected less than wooden ones, but after that the steel spar bent much more than wooden ones before final failure. He did not quite understand Capt. Thurstan's remarks about the spar deflection on a machine flying at one degree. At that angle the centre of pressure would be aft, and the deflection of spars would increase the incidence in the centre of the bay. He also objected to the figures given by Capt. Thurstan for the modulus of elasticity for steel and duralumin—he thought they were too high.

Mr. Pratt here interposed the remark that the figure for the modulus of elasticity of duralumin was taken from the result of tests on actual spars. Used in conjunction with the formulæ given in the paper it gave deflections which agreed with tests. It was not the same value as that obtained from an ordinary test piece.

Dr. Hatfield said that his connection with Capt. Thurstan in this matter dated back two and a half years, when the question of suitable steel for aeroplane construction was gone into. The material did not then exist. Largely owing to the enthusiasm of Dr. Thurstan its preparation had been greatly facilitated.

A question not yet investigated arose from the fact that at great altitudes the temperatures became very low. Dr. Thurstan: As low as minus 30 degs Cent.). The effect of this on strength of materials must be taken into account. He believed that steel would score heavily on this point. Down to even lower temperatures steel slowly increased in strength, with a slight loss of ductility. Wood, he believed, lost strength rapidly at very low temperatures.

Since duralumin was so profoundly affected by low temperature heat treatment, it seemed possible that it might behave very differently to steel.

What did Dr. Thurstan mean by his statement that mild steel was more adversely affected by local damage than was a high tensile steel? Generally a local imperfection led to a high local stress, and with a highly ductile steel local deformation allowed of a distribution of the stress. High tensile steel did not possess the required ductility.

He would like to know how much of the experimental work Dr. Thurstan referred to was in the form of actual flying tests—or was it all laboratory work?

Mr. J. D. North (Messrs. Boulton and Paul) said that the work which had been done in metal construction was largely due to the efforts of Capt. Thurstan's Department.

During the war metal construction had blossomed in the sun of official approval, watered by a gentle dew of financial assistance. Would this state of affairs continue?

Mr. D. T. Mooney (the Steel Wing Company) said that the paper must be considered as classic. Capt. Thurstan said that one year ago, out of 1,000 Allied all-metal machines, not one was of British manufacture.

There was at least one British all-metal machine in existence over a year ago. He referred to the British M.R.1. The wings for this machine were built by the Steel Wing Company, and had given satisfactory results in the air.

Most of the metal spars shown that evening were intended for wings with wooden ribs, etc., and not for all-metal wings. His firm had abandoned spars having characteristics similar to some of the sections shown because of the difficulties of attaching metal ribs to them; and had developed spars which made such attachment simple. An all-steel Avro wing of their make, which, on test, had not failed at nine times normal loading, was assembled by two girls without skilled supervision. This type of wing had been subjected to all flying tests.

The Chairman, Brigadier-General Bagnall-Will, in reference to the question of local damage raised by Dr. Hatfield, wished to know what kind of local damage the lecturer referred to.

He also wished to emphasise the danger of tests made by pure bending. Tests should simulate working conditions. What tests had been made of the effects of stress reversal and vibration.

With reference to the lecturer's prejudice in favour of simple carbon steels, he was inclined to agree with the view that for the average user of steel, a material with the widest latitude in heat treatment had advantages. At the same time, during the war most firms had learnt to work alloy steels to the fine temperature limits necessary, and this danger was not now grave.

Capt. Thurstan's Reply.

In reply, Capt. Thurstan thanked the audience for their kind reception of his efforts. He would have liked to have replied at length, and to have asked a lot of questions.

In reply to General Bagnall-Wild, the class of local damage to which he referred was the small dent. Vibration tests had been made whilst metal wings were sand loaded.

With regard to Mr. Pratt's remarks upon cost, he thought it would be very foolish to take present-day costs as any guide at all. With improvement in design and with the development of automatic and semi-automatic machinery for the work the cost would fall rapidly.

He agreed with Major Wylie on the subject of rigidity versus flexibility. Major Wylie had explained what he (Capt. Thurstan) really meant. As to Major Wylie's bewilderment on the change of wing incidence with spar deflection, could not one neglect the centre of pressure? There was a change in the incidence, and it was bound to modify the load distribution. He confirmed Mr. Pratt's statement that the figures for the modulus of elasticity were ones found to give correct results when used in the expressions given in the paper.

He would like to spend an hour at least talking to Dr. Hatfield. The matter of the very low temperatures reached high up and their effect on the strength of materials certainly required investigation.

In the matter of local damage he referred really to dents such as would be produced in mild steel if a mechanic dropped a hammer upon a spar. If the spar were made of high tensile steel it would not dent under such conditions. (A good deal would here depend upon the particular mechanic, and the actual hammer.—Ed.)

After the usual vote of thanks to the lecturer, moved by the Chairman, General Ruck moved a vote of thanks to Brigadier-General Bagnall-Wild for having presided at the meeting, and the assembly dispersed.

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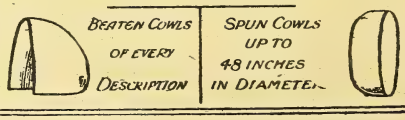
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MARKET TOPICS.

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MAY 15th, 1919.

COPPER.—The price for Copper continues reasonable and firm, but buyers are not very active; in fact, sellers predominate. The recent return of Government stocks shows that the demand has been very unsatisfactory, and has not yet come up to expectations; the stocks have increased by 2,428 tons, the figures being—May 1st—51,130 tons; April 1st, 48,702 tons. In seeking for an explanation of the hesitancy which is being shown by buyers it is difficult to arrive at a satisfactory reason.

The most feasible suggestion is that buyers are not yet covering their requirements for a full scale Peace programme, because of the uncertainty of prices of other metals, such as Steel, Iron and Tin; even if this is the case, it is difficult to see why, with prices at their present level, buyers should continue to buy hand-to-mouth, as the tendency is for prices to harden and a substantial decline is very unlikely. The prices of demanufactured Copper are still out of proportion with Ingot Copper, but the demand is good.

The market in U.S.A. is in a state of stagnation, and buyers continue to buy hand-to-mouth, consequently stocks are accumulating, the demand being much less than the quantity produced, even at the reduced output.

COMPARATIVE PRICES.

	Per Ton. £ s. d.
To-day, May 13th	77 10 0
Last week	76 12 6
Last year	110 5 0
Average price, 1918	115 10 0

TIN.—This market is in a very unsatisfactory condition, and is still very sensitive, with the result that rapid fluctuations continue to take place. Last week prices commenced to harden and a rapid advance was made from £227 to £236 10s. This advance does not reflect the true position of the market, and is apparently only a temporary move.

Actual customers are very backward and continue to buy hand-to-mouth. There must be large stocks accumulating in the Straits, China and U.S.A., and, although in some quarters it is expected that there will be a huge demand from the Central Powers when Peace has been signed, it is doubtful whether it will come up to expectations, as it is practically certain that the German and Austrian Governments will control the purchase of raw materials for importation, further it is not certain that they will be in a financial position to make heavy purchases for some time.

The position in U.S.A. is about as unsatisfactory as it is here, and the outlook is very uncertain.

COMPARATIVE PRICES.

	Per Ton. £ s. d.
To-day, May 13th	236 10 0
Last week	227 17 0
Last year	375 0 0
Average price, 1918	329 10 0

LEAD.—The last report of Government stocks is very disappointing, and shows an increase of 12,556 tons over April, the figures being 109,012 tons on May 1st, and 96,456 tons on April 1st. It was certainly expected that there would be a reduction and the estimates of consumption for April were a little too optimistic. It must not be concluded that the consumption has declined; in fact, there has been an increase, but the arrivals have been in excess of consumption. Notwithstanding the large increase in stocks, the price continues firm, and there does not appear to be any hope of a reduction at present.

STEEL.—The condition of this market is very unsatisfactory, the prices which are being demanded are very high, and there is a feeling in some quarters that there is every possibility that there will be a reduction very soon. On the other hand, there are rumours that the price of fuel will shortly be advanced, and if this proves to be correct, it is more than likely that the prices of Iron and Steel will be affected. Generally speaking, the outlook is very uncertain, and it is difficult to say what will happen.

There is certainly an improvement in the demand for finished Steel, but the market for Aircraft Steels is lifeless, and the same remarks apply to High-speed Steel. It is doubtful whether America can seriously compete with English Steel makers for some time, owing to the difficulty in obtaining freight. They are, of course, in a position to compete for other export trade, and are, in fact, making great efforts to get a lion's share of the business.

TIMBER.—There has been a slight improvement in this market, but actual consumers are still hesitating, and this is not surprising, in view of the prices which are ruling at present. The prices paid for Mahogany at the recent sales have been on the high side, and unless there is a decline in values it is difficult to see how some of the trades are going to compete with foreign competition.

There has been very little Silver Spruce imported recently, and the quality of the material available in this country is far from satisfactory. It will, undoubtedly, be some time before there is a fair demand for this Timber, but firms who only hold small stocks should look ahead, as they will have difficulty in obtaining good supplies of first-class Timber from the stocks which are available at present.

It is not yet clear whether constructors are compelled to apply to the Air Ministry for their supplies; if it is still necessary to do this, then it is advisable to simply buy hand-to-mouth, as the Government stocks are far from satisfactory.

FABRIC.—It is understood that a small portion of the Government stocks have been disposed of, but the majority of the material is still held in store, and, apparently, it has not been decided what will be done with the material, although it is assumed that it will be put up for auction. If this is the case firms should ascertain if they will be allowed to use this material for commercial aeroplane construction, should it be purchased under the hammer.

It is understood that the material has been purchased at prices ranging as low as 1s. 6d. per yard, 36 ins. wide. As previously pointed out, the Government price is 3s. 1d. per yard, 36 ins. wide, and it is even expected that when the material is free from control prices will most likely advance.

A NEW CONSULTANT.

Mr. Eric Neal, A.F.R.Ae.S., who during the war has been in charge of R.A.F. special affairs in Paris, has joined forces with M. Leplanquais, formerly works manager of the Spad Company, and the partners intend practising in France and England as consulting aeronautical engineers, and in particular as surveyors for the aviation insurance companies. The partners are also undertaking to place manufacturing licences in France for British inventions and *vice versa*. Their address in Paris is—The Aircraft Improvements Company, 167, Rue Montmartre.

In addition to the work already mentioned, the partnership is prepared to place British business in Italy as well as in France, and is also arranging for the manufacture in Great Britain of the fireproof petrol tanks which have been used extensively and successfully in France.

COPPER COVERED CYLINDER FINS.

Mr. Granville Bradshaw, the designer of the A.B.C. engines, has obtained very successful results from air-cooled cylinders with a heavy coating of copper deposited on the fins. The effect of this copper deposit is to increase the rate of heat transference to the air, thus improving the cooling and avoiding such troubles as distortion due to overheating.

Large numbers of these engines have been ordered by the Air Ministry, and quite a number of sub-contracting firms have found considerable difficulty in securing an even deposit of copper over the surface of the fins right down to the bottom of the grooves on to the actual body of the cylinder.

A certain amount of success has been attained by some firms, but multifarious processes had to be adopted to obtain anything like the desired effect. The time taken in these processes was very considerable (up to 50 hrs. per cylinder), and this, of course, limited the output.

For the past few months the firm of Andrew Ness, Ltd., 115, High Holborn, W.C.2, have been making experiments with the electro deposition of copper on these cylinders and, in conjunction with their chemist, Mr. Quintin Marino, have now evolved a special process which enables them to obtain an absolutely even copper deposit upon the cylinder in from four to five hours.

In this process many of the operations required by the former methods become unnecessary, less plant is required, labour is cut down to a minimum, and the output per vat is enormously increased.

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COMMERCIAL AERONAUTICS & CIVIL AERIAL TRANSPORT

THE AERIAL FUEL OF THE FUTURE.

Will it be an Alcohol Mixture?

By "Medway."

I have always been something of an enthusiast on the subject of alcohol fuel for internal-combustion engines. There have been plenty of attempts made to do something practical in the way of creating alcohol fuel supplies. They have one and all lacked any official support, mainly because the Customs and Excise and the distillery interests have been united in an endeavour to get nothing done.

Regarded as Perverted Dipsomaniacs.

It is always easier to persuade the Government to do nothing than to coerce it into doing something. Hence the whole idea has more or less got into disrepute. The failure of the fuel to materialise has been attributed to some fault of its own, instead of to extraneous influences. Those who believe in it are in some quarters regarded as amiable idiots or else as perverted dipsomaniacs, who would rather get denatured alcohol than no alcohol at all.

However, before my readers accuse me of some congenital mental deficiency on account of my continued championship of the cause of alcohol fuel, let them consider what other people thought of *them* a few years ago when they ventured to suggest tentatively that aerial locomotion might perhaps be a practical factor in the future of transport. If it were not for people who kept on hammering, despite neglect and ridicule, much of the progress that has taken place in the last generation or so would have been delayed for a hundred years or more.

Some months back I mentioned in these columns the possibility of alcohol becoming *a* fuel, if not *the* fuel, of aircraft. I must confess, however, that one aspect of the proposition entirely escaped me at that time. Since then there has been formed an official Alcohol Motor Fuel Committee. Up to the present it has spent its time like most other official Committees in taking evidence to elicit facts already known; in organising its procedure, and in futile conversations.

Waiting for Government Grant.

This is not altogether the fault of the Committee. I fancy that those of its members that know anything of the subject only joined it in the first instance because they hoped against hope that its formation meant the awakening of official interest, and that an early step would be the offer of a Government grant.

The holding of meetings and the taking of evidence cost nothing, so the Government is willing enough to allow this kind of thing to go on. The Committee is, however, unless I am misinformed, getting restive. The expenditure of time by its members may, and probably does, mean loss of money to them, so that they are disinclined to go on indefinitely. Meanwhile the expected grant does not materialise, and it looks as if we were no further forward than before.

Discussing these facts the other day with some people prominent in the motor vehicle world, and mainly from their point of view, the subject of commercial aeronautics came up as having a very important bearing upon the future demand for fuel. Even the thirstiest motor vehicle cannot rival R33 in absorbing sixty gallons of petrol an hour.

From the commercial point of view R33 is rather a small airship. We shall presently have aerial vessels crossing the Atlantic at an expenditure of not less than a hundred gallons of fuel an hour, or a total of perhaps fifteen to twenty tons for the trip. Before long there will be a good number of these ships. There will be also thousands and tens of thousands of aeroplanes working regularly in commercial service and for the carriage of mails, or passengers, or plying for hire as pleasure vehicles.

The Handicap of Monopoly.

Even before the war, when the immediate arrival of the aeroplane was not generally anticipated, motorists were very worried over the steady increase in the demand for fuel and the very slight increase, if increase existed at all, in the supply. They were beginning to realise that this supply was not inexhaustible, and, moreover, that it was inconveniently controlled by a very few people with the power of running up prices to any figures they fancied.

If the position was bad then, it must be infinitely worse now that we realise that aerial traffic is a rapidly growing institution. It seems clear that some big users of liquid fuel will have to do without petrol.

Here I get back to my old contention that alcohol is the only real solution of the difficulty. It can be produced year after year indefinitely and in any quantity. There are millions of acres of land suitable for the growing of alcohol crops, but at present valueless and uncultivated. There is an immense supply of labour available in countries where trade unions are not known and restriction of output has never been heard of.

Alcohol Crops.

From the motorists' point of view, the big trouble in the way of using alcohol is first and foremost that he cannot get it, mainly because the Government will not let him. Assuming that this little difficulty were overcome and a certain amount of sense knocked into the heads of people whose one and only idea is the revenue from Customs and Excise, we could create the supplies of alcohol crops easily enough.

Admittedly, the growth of such crops in this country would be a miserable commercial undertaking. Such crops flourish where there is sunshine, more or less as a regular daily event and not as a kind of surprise once or twice a year. We could get alcohol from potatoes or beet grown here, but the cost would be prohibitive; land is too expensive, and so is labour.

It follows, then, that if we want big supplies we must grow them in tropical and sub-tropical lands, distil on the spot, and then use tankers for transport to this country. This would, of course, add to the expense enormously.

Further expense would be entailed by the system of distribution in detail, which would be needed if motorists had to depend on the fuel and expected to find supplies at every garage.

Is there, then, no use for alcohol as a fuel which would not involve this expensive transport and still more expensive distribution? I suggest that undoubtedly there is, but whether I am right or wrong depends on whether alcohol can be made the best, or at least a good, fuel for aircraft engines. Taken alone, it would probably be useless. It does not lend itself to employment in an engine designed to produce great power while being very compact and light.

Starting-Up Difficulties.

For starting up in cold weather it is positively beastly. When mixed with benzol or petrol, or both, it could probably be made usable, but not really good. The most promising suggestion up to the moment is in the direction of alcohol-ether mixtures. The ether can be got by a continuation of the process of the manufacture of alcohol itself, or, at any rate, from the same materials and in the same distillery. Ether is thoroughly volatile, and an engine can be started up on an alcohol-ether mixture in any weather and without any difficulty.

It is, therefore, reasonable to presume that we can get an alcohol fuel suitable for aircraft without necessarily mixing the alcohol with a fuel of the petrol or benzol order. If the idea were to collect all the supplies in this country, there would be no particular objection to a benzol mixture. The idea is, however, to do nothing of the kind.

My plan is rather to create the alcohol fuel supplies where they are needed. That is to say, at a number of points along all the great air routes of the Empire. A big proportion of the mileage of such routes must lie in more or less tropical countries. We have considerable freedom as to the location of our intermediate landing grounds, aerodromes, and depots. With a little intelligent planning, these could be placed at points around which alcohol could be grown in huge quantities. Distilleries could be set up upon the spot and a standard process employed in all these distilleries, so that the fuel obtained from all of them should be of one standard quality.

Saving of Transport.

Under this system there would be no question of transporting our fuel to all these points, many of them off the beaten track. At certain of the more convenient points, especially those near the sea-coast, we should extend our alcohol production so as to make it considerably more than enough to meet the need of the local aerial depot. From such points we should export to the terminal stations in this country. This would be the only transport needed for the whole fuel system.

We should, in fact, be reversing the ordinary process. Instead of exporting our fuel—after ourselves importing it—to the various depots on the aerial routes, we should make the bulk of those depots self-supporting and bring to Great Britain the surplus supplies from some of them.

A main aerial route would, in fact, offer ideal conditions under which to employ alcohol. No distribution to retailers would be necessary. Most of the fuel would be subject to no transport costs at all. We should have to meet merely the cost of production. By eliminating transport and distributing costs in this way we could undoubtedly get our supplies of an alcohol-ether or some other suitable mixture at a very much lower figure than we should have to pay for the cheapest and crudest petrol.

Aircraft Must Depend on Alcohol Fuel.

Some day or other, the great aerial routes, which will then be used by hundreds of aeroplanes and airships daily, will have to depend on alcohol fuel because other supplies will be exhausted. Why should we not take the bull by the horns and make up our minds to do now what we must certainly do later on. We should thus make our Imperial aerial traffic independent of imported fuels and effect a considerable decrease in the operating costs of aerial craft of all kinds. We should also assist the development of many valuable portions of the Empire not as yet opened up.

I ask my readers not to regard this proposal as wholly visionary and impracticable. If they think the matter over, they will, I believe, realise that at the most I am suggesting an organised attempt to accelerate a development which is inevitable and from all points of view absolutely desirable.

ENTERPRISE.

Real enterprise is shown in the following letter from Aerofilms, Ltd. :—

"Dear Sir,—We wish to draw your attention to our undertaking of aerial photography, and think it will interest you, as many topical subjects and events could be taken from the air, giving a novel and valuable effect.

"Machines can be supplied by us with aerial cameras and an expert aerial photographer for carrying out this work.

"We should be pleased at any time to quote you for aerial photographic work or to supply any further information, and wish to inform you that we shall be prepared to carry out orders from June 1st.

"(Signed) Yours faithfully, for Aerofilms, Ltd.,
"F. L. Wills (Managing Director)."

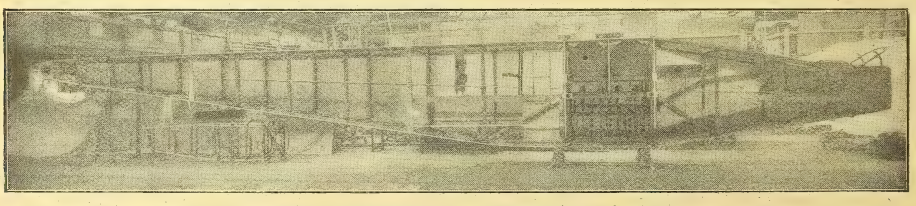
With the assistance of aerial photography the pictures of current events in the daily Press may well become more interesting than hitherto, where elevations only were possible. The other two directors of the firm are Mr. C. Grahame-White and Mr. H. W. Matthews, both directors of the Grahame-White Co.

FLAX CONTROL.

The responsibility for the Flax Control Board has, by a decision of the Cabinet, been transferred to the Board of Trade.

The present members of the Board are being invited to continue to act, with the following amended terms of reference :—"To promote and co-ordinate arrangements, whether by Government Departments or by private enterprise, for the supply and distribution of flax, flax seed, and flax manufactures for Government and civilian purposes, and to take such measures as may be necessary with regard thereto."

All communications with regard to the work of the Board should be addressed to Mr. P. Guedalla, Caxton House, Tothill Street, S.W.1.



A STUDY IN CONTRASTS.—A Handley Page fuselage with a Camel fuselage under its tail. Both built by the British Caudron Co., Ltd., of Cricklewood.

COPPERWORK FOR AEROPLANES

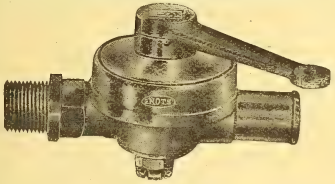
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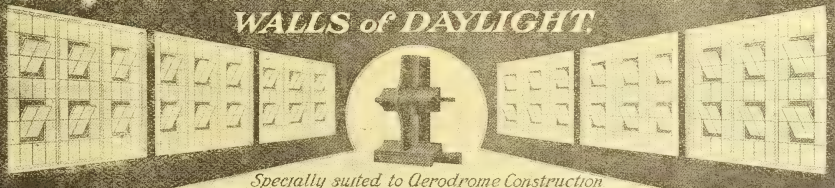
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FICTITIOUS FIGURES ON FLYING.

The following letters have been received:—

Sir,—I am anxious to add my measure to the "piffulent tosh" contributed to THE AEROPLANE by "Engineer Officer" and "Ex R.N.V.R." I will take "Engineer Officer's" arrangement of figures and give my own opinions against his.

As qualifications I may say that I am a civil engineer and have been intimately connected with aircraft during the years of the war.

JOURNEY CONTEMPLATED.

Agreed that it is to be to a point 5,000 miles away with out and home route on one line and machines to be four-engined.

SPEED.

Agreed at 100 miles per hour actual accomplished speed between points 5,000 miles apart. This, allowing time for changing mail bags, etc., must mean an average air speed of 105 miles per hour at least.

LOAD CARRIED.

The load at ¾ of a ton cannot be carried at the required speed by any officially tested machine in existence. The only four-engined machine capable of the speed contemplated is the Bristol Bomber. This machine, with a loading of 9 lbs. per sq. foot, equipped with Liberty engines, can attain a speed of 125 miles per hour and can carry about 20 cwt. actual useful load after deducting six hours' fuel and the necessary crew of five persons.

I assume that some sort of case will be required for containing the mail matter—this will weigh not less than 2 cwts. I also assume that some sort of light boat, with small motor to save both mail and crew, is necessary. This will weigh at least 5 cwts. The total weight available for mail after deducting these two items will now be 13 cwts.

I will further assume that the machines will fly at about 85 per cent. throttle and to allow this a further deduction of weight is considered necessary. This further deduction is assumed to be 2 cwts. The final weight available for mail is now 11 cwts. instead of 15 cwts., as stated by "Engineer Officer."

TIME AVAILABLE FOR FLYING.

The stipulation that machines are to fly by day and night on 300 days a year is, in my opinion, quite impossible. It may be possible to carry out the first condition (although it is still in an embryonic stage), but I should judge that 100 flying days per year would be much nearer the mark for the second condition.

I should like to emphasise the fact that the number of flying days per year is the main factor governing the cost of commercial aviation, and recent events show that this number must not be over-estimated in this country at all events.

TIME FOR JOURNEY.—Agreed.

FLYING DAYS PER YEAR.—100, as above.

MACHINES' ENDURANCE.—Agreed.

MACHINES REQUIRED.—Agreed.

LIFE OF MACHINES.—I agree that the present machines will not be serviceable for more than one year, but anticipate metal construction to more than double this in the future.

LIFE OF ENGINES.—I consider that this item is grossly underestimated by "Engineer Officer"—the life of a good modern engine is at least 500 hours with overhaul.

COST OF MACHINES PER YEAR.—The cost per machine is agreed at £10,000 and motors at £2,000 each, making £18,000 per machine. I will assume that spare sets of engines for replacement are included in the five spare machines allowed for. The total cost of 25 machines will now be £450,000.

Of this total £200,000 represents engine value. I shall assume that 30 per cent. of the engine value is available for use in the following year, and that 10 per cent. of the machine value is also available. This gives a grand total of £365,000 for yearly expenditure on machines and engines.

AVERAGE LOAD.—0.55 ton as above.

MILES FLOWN PER YEAR.—At 100 flying days per year the mileage is 240,000.

TON MILES PER YEAR.—132,000.

PETROL USED.—Agreed.

OIL USED.—Agreed.

PILOTS.—Agreed.

AERODROMES.—Price agreed, but 11 will be required, not 10, as stated. The total cost will then be £110,000.

INSURANCE.—Agreed—but this is a problematical figure.

OFFICES.—Agreed—but 11 are required, and so total cost is now £33,000.

ENGINES, RIGGERS, ETC.—Agreed.

CAR SERVICES.—Agreed, but 11 are required, and so total cost is now £22,000.

TOTAL COST.

	£		Per Cent. of Total Cost.
Machines	365,000	=	42
Petrol	90,000	=	10
Oil	18,000	=	2
Pilots	25,000	=	3
Aerodromes	110,000	=	13
Insurance	100,000	=	11
Offices	33,000	=	4
Engineers, etc.	100,000	=	11
Car Services	22,000	=	4
	£863,000	=	100

= £6.54 per ton mile.

Assuming a profit of 30 per cent., the cost of flight per ton mile = £9.50, not £2.64, as stated by "Engineer Officer," and still less, the figure given by "Ex R.N.V.R."

Speed, indeed, must be paid for, but the conclusions arrived at by the Civil Aerial Transport Committee leave no room for doubt as to 100 miles per hour maintained average speed between points being the lowest possible commercial speed. At the figures given by me mail is still a possible paying proposition, but passenger-carrying is out of the question.

I might say, in conclusion, that a 5,000 mile journey will entail unknown difficulties in aerodromes, transport of food, petrol, etc., and that estimating for these difficulties is at best guess-work.

It might also be noted that the engine costs may be considered as of secondary importance. If the engines in foregoing figures are obtained for nothing, and last for ever, the total costs will be reduced by £200,000, reducing the ton-mile cost to £5.04—an absurd figure for passenger-carrying.

(Signed) "COMMONSENSE."

Sir,—As one of your readers whose lot it has been to be associated with Aircraft during this war, I am interested in the discussion now taking place in THE AEROPLANE on the costs of flying. It strikes me, as an ounce of experience is worth a ton of theory, that some actual figures obtained from experience may be useful, and I am, therefore, sending them.

The first figures were estimated by an Officer lately in technical charge of a seaplane station. They probably represent the worst possible conditions, as the station in question was in a bad situation, and the number of flying hours was, therefore, very small. The number of crashes was also high, and the cost of sheds, largely unused, made this last figure abnormal.

EXAMPLE NO. 1.

	£
Land, yearly rental	3,000
Sheds, cost £250,000 at 10 years' life...	25,000
Men's wages	15,000
Officers' wages	12,000
Lighting power, water, etc.	3,000
Plant cost £15,000 at 10 years' life	1,500
Officers' quarters	500
Men's quarters	500
Stores expended	2,000
Machines, 30 Shorts	60,000
Life, 1 year	122,500
Head Office charges, 15 per cent.	18,375
	140,875
Say	£140,000

Hours flying per year at 20 hours per month, 240; miles flown per year, 14,400; cost of flight per mile, £9.8 per mile; useful load carried, with 3 hours' fuel, 5 cwt.; cost per ton mile, £39.2.

EXAMPLE NO. 2.

An average pupil at a civilian flying school pays £75 to get his "ticket," and takes about 3 hours' tuition time to accomplish it. In the 3 hours he will fly not more than 180 miles, and the cost per mile will be 8s. 4d. per mile. The cost per ton mile is, therefore, £5. This figure is probably distinctly on the low side as a great part of the 3 hours is spent on the ground, or in landings with a "blipped" engine.

The two examples given, both estimated by Service Officers, show, roughly, both sides of the question, one where flying is carried out regardless of expense in war-time, and the other when it is done in Peace conditions, in an aerodrome, a share of whose expenses only have to be included in costs. The profits made on teaching flying by civilian schools are not large—the 30 per cent. figure quoted by "Engineer Officer" is certainly not exceeded even in a well-run school blessed with much good luck.

Commercial flying, on a definite mail route, must surely exceed the school figures, and I am inclined to believe in a figure of about £6 per ton mile as the price of flying for the next few years, at any rate. "A WOULD-BE AVIATOR."

ROYAL AIR FORCE

RELIEF FORCE FOR RUSSIA

THE RELIEF FORCE which is being formed for SERVICE in NORTH and SOUTH RUSSIA will include the following trades: Fitters, Aeroplane Riggers, Armourers, Carpenters, Blacksmiths, Turners, Acetylene Welders, Coppersmiths, W/T Operators, M/T Drivers, Clerks, Storemen, Cooks, Photographers, Tailors, and in addition unskilled men.

Who May Join:

The force will be mainly composed of VOLUNTEERS drawn from the sources mentioned below:

(a) Demobilised and Discharged Trained Airmen or Soldiers.
(b) Trained Duration of War Airmen serving at home.
(c) Airmen at home serving on normal engagements or for 2, 3, 4, 8, and 12 years.

All men re-enlisting must be:

(a) Fully trained in the trade which they desire to join.
(b) Fit for General Service. (c) 19 years of age and over.

A discharged or demobilised airman, if accepted, will rejoin in the rank, substantive or acting, he held at the time he left the Air Force.

Pay and Allowances:

PAY, ALLOWANCES and BONUS as now given to men in the Armies of Occupation. On completion of the period of service all men will be given two months' leave or any longer period to which they may be entitled on full pay and allowances.

Period of Service:

The period of enlistment for recruits will be one year, or such shorter period as may be required, but no man who re-enlists for this duty will be kept longer than required for this special service.

Where to Enlist:

Qualified men should apply at once to the nearest Recruiting Depot at the following addresses:

4, HENRIETTA STREET, COVENT GARDEN, W.C.
8, TYNDALL'S PARK ROAD, CLIFTON, BRISTOL.
12, NEWPORT ROAD, CARDIFF.
CARLTON CHAMBERS, PARADISE STREET, BIRMINGHAM.
8, GEORGE STREET, NOTTINGHAM.
12, ABERCROMBY SQUARE, LIVERPOOL.
THE MOUNT, SPRINGFIELD MOUNT, LEEDS.
10, SYDENHAM TERRACE, NORTH ROAD, NEWCASTLE-ON-TYNE.
9, SOMERSET PLACE, SAUCHIEHALL STREET, GLASGOW.

CIVIL AERIAL TRANSPORT NOTES.

United Kingdom.

The following is an extract from Air Ministry Orders :—

516. Civil Aviation.

It has been brought to the notice of the Air Ministry that companies are being promoted in connection with civil aviation after the war, and that prospectuses are being circulated by such companies amongst officers who are on the point of demobilisation. Before such officers invest their gratuities in such concerns it should be brought to their attention that the conditions governing post-war flying are still unsettled.

Officers are therefore advised to apply for information to the Air Ministry or to seek other skilled advice before investing their capital in response to appeals of this nature, certain of which may not be bona fide.

The " Times " makes the following comment thereon :—

It is the officer who is already demobilised and who has not been able to find a suitable appointment who is most likely to be led into investing his gratuity on promises of large and immediate returns from commercial aviation. Many of the young pilots who have done excellent work in the Royal Air Force during the war have naturally an unbounded belief in the future of flying, but have had no previous business experience and are not competent to judge of the soundness of a commercial undertaking. The established aviation firms have made large profits during the war and are not, therefore, in need of additional capital at the present juncture.

In view of the enormous amount of work still necessary before civil aircraft services can be put into practical operation, all new projects should be very carefully examined as to capitalisation and source of expected profits before investing capital.

According to the " Daily Express " of May 14th, a great deal of civilian flying had been done up to that date, even to the extent of taking passengers from Hounslow to Hamble, near Southampton, to a dance.

A Handley Page aeroplane (four Rolls-Royce engines) with four passengers left Glasgow at 2.30 p.m. on May 17th, and flew over Berwick, Newcastle, Durham, Doncaster, and Peterborough, reaching Hendon aerodrome a few minutes after nine o'clock, a distance of 515 miles having been covered in 6½ hours.

On the following morning it proceeded to Folkestone, the journey occupying 55 minutes. The pilot was Mr. Clifford B. Prodger, who, it is stated, is assisting in the organisation of a London-Paris passenger service.

A three-engined Caproni aeroplane, carrying a crew of eight, landed at Kenley Aerodrome, near Croydon, at 1.10 p.m. on May 19th, having left Turin the same morning.

India.

During the past few months the authorities have been arranging for aerodromes in the chief centres of India. It is believed that the Post Office would consider contracts for reliable aerial mail services, and many firms are said to be ready to organise companies for commercial purposes.

Sweden.

According to a report, Swedish Customs Commissioners have recommended that foreign aircraft be allowed to enter the country free of duty on the pilot's written undertaking to re-export the craft.

THE 35-h.p. AVRO SPORTING MODEL.

It is understood that this machine, to which reference was made in The Aeroplane a short while ago, made a satisfactory preliminary flight at Hamble on Saturday, May 10th.

It was then flown by Capt. Hicks, R.A.F., an Australian pilot.

The 35-h.p. Green engine, which has been considerably modified and fitted with aluminium pistons, ran extremely well, and showed itself capable of flying the machine when throttled down to 700-800 r.p.m.

Later information is to the effect that the machine has now been looped, rolled, and spun, and that it has climbed 3,000 ft. in six minutes at 78 m.p.h.

It must be considered quite a noteworthy achievement to have produced a machine with these characteristics fitted with so low-powered an engine, of the four-cylinder water-cooled type. This is the more so as the 35-h.p. Green engine dates back to at least 1910.

A NIGHT MAIL CARRYING EXPERIMENT.

An interesting experiment in night mail carrying has just been carried out by the R.A.F. authorities.

A D.H. 10 machine with two 412 h.p. Liberty engines from No. 120 Squadron left Hawkinge Aerodrome, near Folkestone, at 10.30 p.m., and, flying straight through without a stop, reached Cologne at 1.30 a.m. The machine was piloted by Capt. Barratt, with Lieut. Fitzmorice as navigation officer and Lieut. Oliver as observer. The course taken covered about 300 miles, and as there was a fairly strong adverse wind the performance at an average speed of 100 m.p.h. was particularly good.

This squadron, in conjunction with No. 110 Squadron at Marisconelle, the transference point in France, has been responsible for the regular Folkestone-Cologne mail service which has been flown since March 1st.

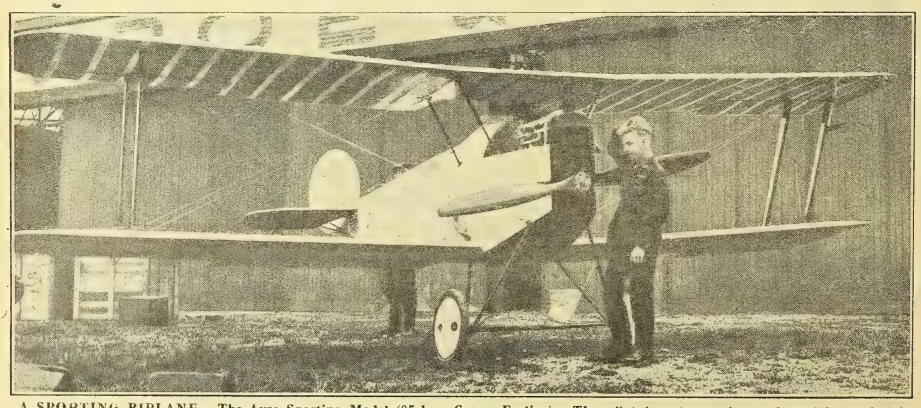
During the period March 1st-April 26th the squadron has carried no fewer than 1,634 bags of mails. In spite of exceptionally bad weather during a large portion of this period, particularly in March, there were only ten days upon which mails were not carried. The total number of mail flights made in these 47 days was 289.

A COMPLIMENTARY DINNER.

On May 16th, at the Connaught Rooms, Sir Samuel Waring, Bt., was entertained at a complimentary dinner by the directors and staff of Waring and Gillow, Ltd., for the purpose of congratulating him upon the baronetcy recently conferred upon him by the King. Some 500 members of the staff of the well-known business house were present. Sir Samuel Waring is interested in the Alliance Aircraft Co., the Bat Company, as well as in the W. and G. aeroplane works.

A CHANGE OF NAME.

The A.G.S. Manufacturers' Association, of 60, Haymarket, S.W.1, announce that it has been decided that the name shall be changed to the Association of Manufacturers of Aircraft Parts.



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in this Country of any Factors or Manufacturers of small aircraft parts, including A.G.S., etc., and a complete list can be forwarded on request, but, as in the days of the War, customers will do well to forward lists of their requirements, which will be priced and returned in the course of post with information as to deliveries—ex stock or over a period. Ascol House also holds complete lists of the stocks of the majority of Aircraft Manufacturers in this Country, and if any parts are required immediately and do not happen to be in stock at Ascol House they can be drawn from these Manufacturers without delay. All parts are passed by A.I.D., but in accordance with recent regulations parts made at Ascol House in the future will have to be inspected at the Contractors' Works, being released from Ascol House for material only, rejections being credited if returned with A.I.D. Rejection Note within 14 days of delivery.

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AIRCRAFT FINANCE

MISCONCEPTIONS ABOUT AVIATION INSURANCE.

Either innate modesty, mental slackness, a distaste for new ideas, or a little of each seem to cause an unnecessary amount of perplexity and confusion in every commercial innovation or new departure. A case in point is that of the recently developed aviation insurance scheme.

MEAGRE OR PROLIX.

Some people, evidently unacquainted with the mathematically precise character of the business of insurance generally, and particularly of the new aviation departure, are loth to give adequate information or sufficiently precise or clear details of what they actually want covered by insurance, or, alternatively, are too prolix, without particularisation, in their proposals.

A SIMILE.

Now it is pretty obvious that just as the ordinary member of Lloyd's will quote what he considers a reasonable premium for the risk of twins or triplets commensurate with the characteristics, congenital or acquired, of the parents, so the underwriter who specialises in aviation risks must necessarily be made conversant with the character of the machine, the pilot, and the work contemplated.

ON STANDARDISATION.

It is quite unreasonable to expect the underwriter to quote a "flat" or uniform rate of premium irrespective of the quality of the machine, the qualifications of the pilot, and the nature of the flying. Aviation is not advanced to that stage, or anything approaching it, yet.

The time will come when standardisation has been approached, when freaks have been eliminated by the natural law of the survival of the fittest, and when, as a result of experience, the necessary collation of essential facts bearing upon the degree of risk has been made—and then it may become practicable to give a greater uniformity to the rates of premium.

ILLOGICAL ENTHUSIASM.

At present one cannot get away from the fact that commercial aviation is not beyond the experimental stage. Admittedly, it has progressed wonderfully during the past year or two, but to claim that it has approached physical or economic perfection would be symptomatic of mental blindness. The process of evolution is slow and tedious, especially to the enthusiast, and the wisdom contained in that old saw relating to the necessity of learning to walk before trying to run is apparent.

WHY SPECULATIVE RATES ARE HARMFUL.

So it is with the elaboration of the concomitant scheme of aviation insurance. The underwriter who quoted a "flat" rate to cover all and any risks without due regard to the machine, the pilot, and the nature of the flying would not be accepting business as a serious commercial proposition; he would be undertaking a gambling transaction. And if his experience was costly with heavy bills for damages to meet, it stands to reason that the next risk he was offered would be accepted only at a huge premium.

SOME ESSENTIAL CONSIDERATIONS.

Those who clamour for more uniformity of premiums on aviation insurance may be enthusiastically considering the interests of commercial aeronautics, but they are, nevertheless, illogical in their reasoning. Take ordinary shipping risks, now brought to a scale of mathematical perfection as the result of long experience and the elaboration and collation of essential facts: here there is a uniformity of premium rates admittedly, but it is true that the quotations differ, being determined by the quality of ship, the nature of the voyage and of the cargo. The differentiation is considerable.

CAPABILITIES THAT ARE UNPROVED AS YET.

Aviation can only expect this degree of uniformity when it has proved by actual experience, not by a year or so of military work and a lot of joy-riding, its capabilities as well as its limitations. The business of aviation insurance will develop and be elaborated and broadened with the progress of aviation itself, if it does not, of course, assist and stimulate aviation by advancing more rapidly, which is not at all unlikely.

NORMAL WEAR AND TEAR.

The rather tough problem of depreciation confronting aviation and aerial projects was discussed at length only a few weeks ago. Perhaps one ought to connect the erroneous impressions created by the 1/500th clause for each flying hour embodied in some of the policies. It needs explaining.

NO FIXED MAXIMUM "LIFE."

First of all let it be clearly understood that the 1/500th deduction in the claim for each flying hour is not a rigid and irreducible minimum; it is the mathematically calculated "life" of an average machine; in other words, an aeroplane after 500 hours' actual flying, with the innumerable landings and consequent jolts, is reckoned to be worn out.

VARIATIONS.

This is not an arbitrarily fixed "life," but is based on actual experience. Nor does it apply to every machine. Some are calculated to be good for 650 hours, and others less than 500 hours; it is a question determined by the nature of the flying, the type of machine and the engine, and the host of other considerations.

Briefly, this normal degree of wear and tear or depreciation is a common feature of insurance, and not one embodied solely into aviation risks. Surely no one would expect to be paid in full the original value of the machine, if, say, *it was worked to death at a great profit* to the owner for 490 hours and then came to grief. It would not then be worth its original value or anything like it. Such a practice would act as an incentive to fraud on the part of the person insured, who would be able to replace a worked-out machine at the expense of the underwriter; it would put a premium on inefficiency, too.

FRESH SURVEY AND RECLASSIFICATION.

But having explained this misunderstood clause it is equally necessary to explain the important reservations. If, say, a machine with a calculated "life" of 500 hours has been worked for 200 hours and then goes into the shop for complete overhaul and refit, the position is changed. Naturally the overhauling and refitting improves it physically and prolongs its "life." This being so, the Aviation Insurance Association, or any other competent authority in the business, will re-survey the machine and re-classify it, and the premium will be re-adjusted

accordingly. It is just the same as with Lloyd's Registry and Shipping. Insurance as a business requires such re-surveys; it is quite clear what would happen if once a classification of A1 at Lloyd's were attained the same classification were held if upkeep and maintenance were neglected.

THE ORIGINAL NUMBER DID NOT REMAIN.

It is well clearly to understand this question of the re-survey and classification of aeroplanes. There are locomotives, by the way, on the railways which have been re-built more than once since they were originally constructed. All that remains of the original work is nil; the distinguishing number is similar to the original christening title; the actual plate is often renewed also, with rebuilt in such and such a date supplementing the date of birth.

This is a matter of bookkeeping. A new locomotive would have to be charged to capital account; a renovated locomotive, new in every particular except the bestowal of a fresh distinguishing numeral may be charged to revenue. This might reasonably happen with aviation companies; it is not economically sound to debit to capital account indefinitely with renewals, repair, and replacements.

WM. J. DAVIS.

CURRENT TOPICS.

POOR WHITEHEAD RESULTS.

Recently the hawking of Whitehead Aircraft Company shares was referred to here. The report is now published, and provides no scope for enthusiasm. On the contrary, it is poor food for the shareholders. The profit is given at £19,686, out of which the interim dividend of £9,304 was paid on the preference shares, leaving £10,382. Out of this the final dividend on the preference shares is paid.

It is explained that the company has been a controlled establishment, its operations being entirely confined to work under Government contract, and large numbers of aeroplanes have been delivered. The 10 per cent. cumulative participating ordinary shares have been changing hands between 8s. 1½d. and 9s.

THE STRENGTH OF AIRCRAFT SHARES.

As a whole aircraft shares have not participated in the general buoyancy sweeping over the Stock Exchange, but there has been an awakening in Napiers. These jumped violently in anticipation of a bonus being belatedly proposed in respect of the past year's operations. Aircraft Manufacturing 7 per cent. Short Term Notes have been changing hands at 100 and 100½. Sunbeams have provided no excitement, while the new Handley Page shares keep moderately active at about 6d. discount.

THE ASTER ENGINEERING CO.

The Aster Engineering Co. made a profit last year of £30,302. The final dividend makes 10 per cent. for the year, free of tax, and £33,282 is carried forward, subject to liability for Excess Profit Duty.

THE TRIPLEX GLASS NEW ISSUE.

Naturally the new shares offered by the Triplex Safety Glass Co. on advantageous terms have been well subscribed. The old shares are selling about 40s., and the new shares with 15s. so far paid up at about 19s. As previously mentioned, the capital is increased to £200,000, and by the present operation the issued capital is 120,000 shares.

A PROMOTER'S AFFAIRS.

At the Bankruptcy Court an adjourned sitting was applied for the public examination of Robert Taylor, engineer's contractor, 97, New Bond-street, W. In association with others he had formed, or assisted in the formation of, a number of companies, mainly with the object of dealing in aircraft and component parts. The liabilities were returned at £50,853, of which £7,853 were expected to rank, and his assets valued at £40,000.

The Official Receiver said that the examination had stood adjourned to enable him to make certain inquiries, and the debtor to provide him with further information. Although he was satisfied that the debtor was making inquiries and trying to supply him with all the information required, a good deal was not yet forthcoming. Moreover, a company with which he had been connected, namely Associated Aircraft (Ltd.), had now gone into compulsory liquidation, and it would be necessary for the Official Receiver in Bankruptcy to examine the debtor with regard to his interest in that concern, as well as for the Official Receiver in company's winding-up to investigate the matter. Under the circumstances he asked for a further adjournment.

Mr. Registrar Mellor ordered the case to stand over until June 17th.

Mr. Ralph Raphael approved on the debtor's behalf.

SWEPT AND GARNISHED.

The following appeared in the "Times" of May 16th:—

Henlow Aircraft Repair Depot is swept and garnished. From the arid little plot in front of the offices which is being dug by military workmen to the piles of still smouldering "junk"—twisted wire and the ashes of incinerated spars—which one happens upon around corners, everything speaks of toilsome hours in clearing up. It is all very new and very recent. Major-General Lamb, R.A.F., Controller-General of Equipment, and Colonel Courtney, of the Salvage and Equipment Branch, visited the depot yesterday, made an inspection of the hangars in company with Lieut.-Col. Measures, the Commandant, and returned late in the afternoon.

Henlow was the subject of the principal disclosure of "X" in Wednesday's letter to the "Times." Certainly, there is nothing so flagitious to be seen there—now—as was witnessed at Farnborough. It gives the impression of well-ordered and circumspect management. There is not much old material lying about. Various reports circulate in the vicinity as to what has become of it, and one especially current is that aeroplane wood was used for weeks in the officers' messes at the depot, and for domestic use in Hitchin during a shortage of coal. A Hitchin dealer bought this as refuse from the depot at £1 per ton.

The official admission is:—

New machines have been dismantled on the instructions of the Air Ministry. They were obsolete, and there was no market for them. They were stripped of fabric, their spare parts stored, and their metal fittings removed. As far as the wood is concerned, one fact must be borne in mind. The call on timber for aeroplane construction was so great during the war that seasoned material was soon exhausted, and the contractors had to subject the wood to artificial treatment. That rendered it useless for anything else. We only wish that somebody had come forward with a suggestion of how to employ it commercially.

The stuff comes to the depot by rail, and we have no option but to accept delivery. It may be dumped for a day or two, but is moved as soon as possible to its allotted place. What happens afterwards is solely a matter of instructions to us by the Ministry.

If it is asked, "These new machines had been passed by the Aircraft Inspection Department?" the answer is, "We have no concern with the policy of the Ministry."

Every other adverse statement affecting the depot was met with emphatic demur. "They will be officially denied, and denied very strongly," was the reply to each question. A complete "non possumus" confronts such inquiries at Henlow. Most of the people who knew about these things have departed, building has practically ceased, and splintered staves are no longer a need. The exhalation of reassurance about the place after General Lamb's visit yesterday could hardly be mistaken.

The erection of the Henlow depot was begun in August, 1918. It has now been completed, except for part of its electric power installation, and is about to be taken over by the Air Ministry from the contractors. Before the armistice it employed some 6,000 hands. These have now been reduced to about 1,200 men, mainly on account of demobilisation. It is apparently intended to maintain the depot as a permanent repair centre during peace time, with personnel consisting of discharged soldiers and sailors.

THE NEW AEROPLANE.

The "Daily Mail" published the following verses on May 17th:

"O! wondrous bird!" I cried,
"Destined one day to glide
In graceful fashion through the upper strata
Of our uncharted air,
Although I know not where
Because I lack the necessary data.

"Perchance you yet shall sweep
Across the Western deep
And wing your breathless way until you settle
On Chimborazo's crown
Or drift in spirals down
Upon the slopes of Popocatapetl.

"What wealth of human skill
Is lavished on thee still,
What expert and meticulous inspection.
What thought for stress and strain
To help thee to attain
The sum of every possible perfection!"

"Nay, nay," the 'plane replied,
"Your guess is somewhat wide,
For in the hour of birth my being ceases.
No farther shall I roam
Than Henlow Aerodrome,
Where eager hands shall hack me into pieces!"

TOUCHSTONE

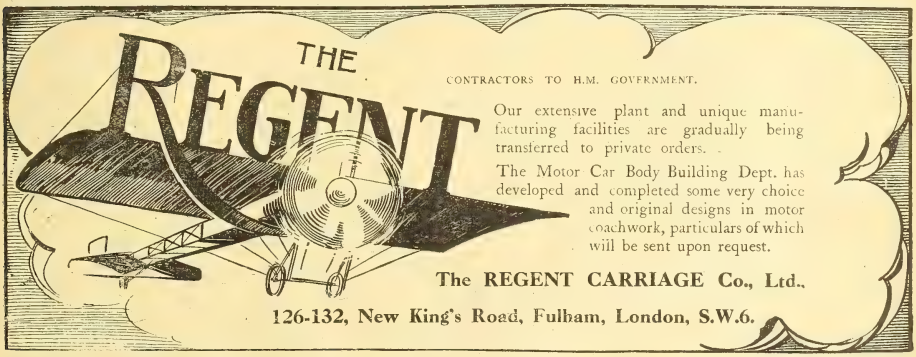


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AIRCRAFT IN PARLIAMENT

The following oral answers were given on May 12th :–

ROYAL AIR FORCE PREMISES.

Brig.-Gen. CROFT asked the First Commissioner of Works whether it is contemplated that certain premises at present occupied by the Central Prisoners of War Fund will be commandeered for the purposes of the Royal Air Force, and whether, having regard to the fact that these buildings are urgently needed for private purposes, he will take immediate steps to prevent such action on the part of the Royal Air Force, and to find quarters of a less extravagant character and less harmful to public interests.

Lieut.-Col. Sir J. HOPE asked whether the block of buildings at 4, Thurloe Place, South Kensington, recently occupied by the Central Prisoners of War Committee, was offered for sale by tender in January last, and the tender of an Army officer, crippled in the war, was accepted on February 15th, 1919, under the authority of the Government; whether the building has since been commandeered by the Air Force; and if, in view of these facts, the First Commissioner of Works will consider the justice of surrendering the premises

The FIRST COMMISSIONER OF WORKS (Sir Alfred Mond) : These premises being accommodation for the Royal Air Force, the matter is one for the Secretary of State for Air, to whom these questions should be addressed.

Sir J. POPE : Does the right hon. gentleman exercise no control over the commandeering of houses in London ?

Sir A. MOND : These premises are for military purposes, and not for civil accommodation. They were commandeered by the War Office, and the matter has nothing to do with my Department in any way.

General CROFT : Was the right hon. gentleman consulted when the Prisoners of War Department moved into this building ?

Sir A. MOND : No, Sir; the War Office commandeered the premises.

* * *

The following written answer was given on May 12th :—

ROYAL AIR FORCE PAY OFFICE—WOKING.

Lieut.-Col. Sir A. WARREN asked the Secretary of State for War if his attention had been called to the conduct of affairs at the Royal Air Force Pay Office at Woking, if he is aware that numerous complaints are being received as to the unbusinesslike methods in operation there, imposing much annoyance and hardship upon men entitled to pay; and if he will make the matter inquired into.

Lieut.-Col. ARCHER-SHEE asked the Secretary of State for War whether he is aware that many demobilised men of the Royal Air Force are complaining of the long delay in getting their gratuity and back pay; and whether he will take steps to ensure that the Royal Air Force Pay Office, Woking, clears up these men's accounts within a reasonable period after demobilisation.

Major-Gen. SEELY : The work of the Woking Pay Office has been under constant supervision, and all possible steps have been taken to speed up the clearance of the accounts. Arrears at one time existed owing to an increase in the rate of demobilisation, but those arrears have now been cleared up. The complaints received have been in many cases due to misunderstanding on the part of the men concerned of the deferred payment system. As previously stated, this system was introduced to enable men who were in a hurry to return to civil life to receive demobilisation in advance of the final settlement of their accounts. All men accepting the scheme signed a personal statement to the effect that the final balance due to them would not be claimed until three months after the expiration of their demobilisation furlough. In spite of this, numerous demands for immediate settlement are being received. In these cases the accounts are being settled several weeks earlier than was promised, and in necessitous cases advances are being made additional to those which were made to the men on leaving their units. The deferred payment system, having served its purpose, has now been cancelled.

* * *

The following oral answer was given on May 13th :—

CRAMLINGTON AERODROME.

Sir FRANCIS BLAKE asked the Secretary of State for War whether the construction of the aerodrome at Cramlington, Northumberland, is still being proceeded with; what number of men are being employed in such construction; what rates of pay and travelling allowances are being paid them, and whether it is the policy of the military authorities to establish a permanent station at this place.

The UNDER SECRETARY OF STATE FOR AIR (General Seely) : The answer to the first part of the question is in the negative, but twenty-two men are at present employed in clearing up materials. The rates of pay are those fixed by the Tyne and Blyth Conciliation Board for Building Trades. It is not intended to establish a permanent station.

* * *

The following written answers were given on May 13th :—

ROYAL AIR FORCE.—GRATUITIES.

Lieut.-Col. Sir F. HALL asked the Under Secretary of State to the Air Ministry whether warrant officers, late Royal Naval Air Service, who received the rank of second lieutenant at the amalgamation of the two services, the Royal Naval Air Service and Royal Flying Corps, on April 1st, 1918, are entitled to the same gratuities for time served as warrant officers, Royal Naval Air Service, as those laid down for temporary officers in the Royal Navy.

Major-Gen. SEELY : Temporary warrant officers of the Royal Naval Air Service who have been granted temporary commissions in the Royal Air Force are entitled to the same gratuities in respect of their warrant service as temporary officers in the Royal Navy.

ARMOURER'S ACCOUNT.

Mr. ALFRED SHORT asked the Financial Secretary of the War Office whether Samuel Taylor, late 407698, Armourer, C Squadron, Royal Flying Corps, A.M. School, Uxbridge, was discharged on February 6th; whether he has received neither back pay nor gratuity; and, if so, will he cause inquiry to be made and a settlement expedited.

Major-Gen SEELY : This man accepted the deferred settlement scheme whereby he received at the time of his dispersal twenty-eight days' pay and ration allowances, £2 12s. 6d. plain clothes allowance, and an advance of £2 on account of his gratuity, pending the final settlement of his account within a period of four months from the date of his leaving his unit. The balance due on the final settlement of his account is now being paid.

STATION HOTEL STIRLING.

Major GLYN asked the Under Secretary of State to the Air Ministry whether immediate steps can be taken to release the Station Hotel, Stirling, from the control of the Air Service on account of the shortage of hotel accommodation, and the near approach of the summer season; and whether since last November the office staff of the Royal Air Force in Stirling has been reduced to such an extent that rooms formerly used in the hotel are now standing empty.

Major-Gen. SEELY : Orders have been given for the early relinquishment of these premises, and I expect that they will be vacated in the course of the next two or three weeks. At the moment all the available rooms in the hotel are occupied.

WOMEN'S ROYAL AIR FORCE.

Lord H. CAVENDISH-BENTINCK asked the Secretary of State for War how many women officers and members applied for enrolment in the Women's Royal Air Force during the time that Miss Douglas-Pennant was commandant of the Women's Royal Air Force ?

Mr. CHURCHILL : The number of enrolments (including transfers from the Women's Royal Naval Service and the Queen Mary's Army Auxiliary Corps) during the period referred to were : Officers, 262 and other ranks, 15,128.

AERONAUTICAL INSPECTION DEPARTMENT.

Mr. MANVILLE asked the Parliamentary Secretary to the Ministry of Munitions (1) if he is aware that the demobilisation of the Aeronautical Inspection Department (Coventry District) is not being carried out in accordance with his statement in Parliament, i.e., that the residue to be retained would consist of discharged soldiers providing they possessed the necessary qualifications; (2) why Mr. Frank Holder, Coventry District (Engines), registered No. 5203, examiner-in-charge, grade 1, a discharged soldier with disabilities contracted during military service, has been discharged from his appointment notwithstanding that civilians are being retained in the Department.

Mr. KELLAWAY : The policy pursued by the Aeronautical Inspection Department is that indicated in the reply to the hon. and gallant Member for Fylde on Feb. 25th. I am making inquiries into the position in the Coventry district generally, and particularly respecting the case referred to in Question No 98. I will communicate with my hon. friend in due course.

* * *

The following oral answers were given on May 14th :—

TALLAGHT AERODROME, DUBLIN.

Mr. ARCHDALE asked the Secretary of State for War if demobilised soldiers are not allowed to work at Tallaght Aerodrome, close to Dublin, unless they join the Transport Workers' Union or one of its branches, and if that body charges demobilised soldiers 10s. 6d. as fee because they have served, the ordinary fee being 2s. 6d.

The UNDER SECRETARY OF STATE FOR AIR (Major-Gen. Seely) : Difficulties have arisen at the aerodrome through the refusal of union men to work with non-union, but I am informed that no pressure is brought to bear on the latter to join the Transport Workers' Union, if they prefer to join some other recognised union. I am further informed that no distinction is made as regards fees for admission or re-admission to the Transport Workers' Union between ex-soldiers and other men.

Colonel ASHLEY : Were sixty or seventy demobilised soldiers requested by the Transport Workers' Union to join that union, and did the chief engineer call up the men and tell them that they must join or they would be discharged ?

Major-Gen. SEELY : There is always difficulty in securing the co-operation of those who are in a union and those who are not. In this case, so far as I can ascertain, the best steps have been taken.

Colonel ASHLEY : If the discharged men would form a union of their own, would not that get over the difficulty so far as the Air Department is concerned ?

Major-Gen. SEELY : If it is any recognised union all difficulties cease.

ROYAL AIR FORCE—DISABLED OFFICER (EMPLOYMENT).

Colonel YATE asked the Under Secretary of State to the Air Ministry whether he is aware that a wounded and disabled officer, who was a trained mechanical engineer and specialist in mechanical drawing before the war, who rose from second lieutenant in the Royal Field Artillery to the rank of major and battery commander during the war, and won the Military Cross, and who, after being wounded, was employed at the Air Ministry Drawing Office, Ministry of Munitions, Ap. D (D), was discharged on reduction of staff, while certain civilians were retained; and whether, under such circumstances, if he cannot retain this officer in the Air Ministry, he will obtain suitable employment for him in some other Government Department.

The FINANCIAL SECRETARY TO THE MINISTRY OF MUNITIONS (Mr. James Hope) : I am making inquiries into this case, and will communicate with my hon. and gallant friend as soon as they have been completed.

Colonel YATE : Can the hon. gentleman say whether the Air Ministry have given due consideration to wounded and disabled men ?

Mr. HOPE : I am answering for the Minister of Munitions, and cannot speak for the Air Ministry.

LIEUTENANTS (PAY).

Colonel DU PRÉ asked the Under Secretary of State to the Air Ministry whether the pay of a second lieutenant of the Royal Flying Corps was 12s. per day as equipment officer; whether on transfer to the Royal Air Force these officers received a form stating that their pay would not be reduced; and, if so, whether he can state why such an officer on promotion to lieutenant and appointment as court-martial officer was paid at the reduced rate of 11s. 6d. per day ?

General SEELY : The pay of a second lieutenant holding the appointment of equipment officer, third class, in the Royal Flying Corps was as stated in the question, and such officers, in common with others transferred to the Royal Air Force on its formation, were given an undertaking that they would not suffer in the matter of pay, so long as they continued to carry out duties similar to those falling to them prior to transfer. On vacating the appointment of equipment officer, on appointment as courts martial officer, an officer of the Royal Air Force would be transferred from the technical to the administrative

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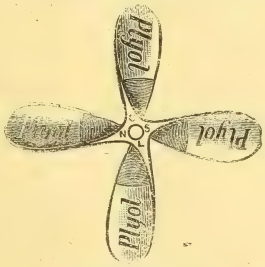
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branch of the force, and would draw the rate of pay of his rank in that branch, whether higher or lower than his previous rate. If my hon. and gallant friend will communicate with me on any particular case he may have in mind, I will have its merits investigated.

* * *

The following written answer was given on May 14th :—

ROYAL AIR FORCE—KENNINGTON GARAGE.

Lieut.-Colonel MOORE-BRABAZON asked the Under Secretary of State to the Air Ministry whether he is aware that, in spite of the fact that the Women's Royal Air Force are asking for more drivers, women of long experience are being dismissed from Kennington; why it is that such action is being taken at Kennington alone; whether the employment of newly-enlisted men without previous experience, costing the State 14s. and 29s. a week more for light and heavy cars respectively, is in any way equitable or economical; whether he will take steps to see that the general management of the Kennington garage be investigated, both from the point of view of its attitude towards members of the Women's Royal Air Force and economy generally in personnel.

Major-Gen. SEELY : Any recent recruitments of women drivers have been for the Mobile Division of the Women's Royal Air Force. The dismissals at Kennington have been of women belonging to the Immobile Division, who can only be employed in the neighbourhood of their own homes, and they have been replaced, so far as possible, by demobilised Service men. I am advised that, taking all factors into account, this action tends to economy. With regard to the last part of the question, I am having special inquiries made.

* * *

The following oral answers were given on May 15th :—

AEROPLANES (DISPOSAL).

Lieut.-Colonel Sir SAMUEL HOARE asked the Under Secretary of State to the Air Ministry whether he can form any estimate of the loss involved to the State by the destruction, at the Cove Camp, Farnborough, of a number of new aeroplanes never used and many not even unpacked; and whether he could not find a market in neutral countries or amongst civilian purchasers for the sale of these brand new goods.

The UNDER SECRETARY OF STATE FOR AIR (Major-Gen. Seely) :

1. On the signing of the Armistice the Air Council had some 20,000 aeroplanes and seaplanes on charge, and machines were being produced at the rate of 4,000 a month. The storage available, including hirings which had to be given up, was insufficient to enable these numbers to be stored under cover as well as the new machines of which the Air Council would have to take delivery.

2. The Air Council had three alternatives :—

(1) To erect or hire buildings to store all serviceable machines, in the hopes that a market would be found for those not required by the Royal Air Force in peace.

(2) To break up the least valuable machines, sending the useful portions to the Disposal Board and selling the remaining material as scrap.

(3) To remove the instruments and engines, burn the machines and sell the metal remains as scrap.

3. The first alternative would have been very costly and the market for the older machines before they became unserviceable in store did not justify such a course. The third would have required less expenditure of labour, but the disposal authorities of the Ministry of Munitions considered that a market might be found for the salved parts, and the second alternative was, therefore, adopted by the Air Council.

4. The Air Council, in accordance with the policy they adopted, divided the machines into three classes :

(a) Standard machines for the Royal Air Force.

(b) Machines obsolete for use in the Royal Air Force in peace or war, but suitable for civil aviation.

(c) Machines obsolete for war purposes, and not suitable for civil flying.

5. On March 31st there were 15,700 machines of the first class; of these large numbers are surplus to the requirements of the Royal Air Force, and are available for sale. On the same date there were approximately 1,000 of the second class, also available for sale to the public. There were 3,600 of the third class still awaiting reduction to produce.

6. The disposal Board of the Ministry of Munitions are responsible for selling machines of class 1 and 2 not required by the Royal Air Force, but the Board have no large storage accommodation available, so that the machines for disposal usually remain in Royal Air Force storage until a market is found for them by the Board.

I am sending an officer to make sure that the policy of the Council is being efficiently carried out at Farnborough and Henlow, but I have no doubt that the policy adopted by the Air Council after the Armistice was sound, and involved the least possible cost to the State.

Lieut.-Col. MALONE : May I ask whether any attempt has been made to find a market for these machines in foreign countries and is he aware that some of these machines which have been destroyed are new machines straight from the manufacturers?

Major-Gen. SEELY : I deal with the question in the very long statement which I have read and I must apologise to the House for its length. The machines from which the engines are taken out and the rest disposed of by auction to the best bidder are machines which are not suitable for the Air Force and are not suitable for civilian flying. Some of these machines are quite new, but the science of flying progresses so quickly that many of them are now obsolete. It would be wrong to send our flying men in the Royal Air Force into the air on those machines and it would be equally wrong to release them for civilian flying. If we could have foreseen seven or eight or ten months what we know now we would not have made them, but that is inevitable.

Lieut.-Commdr. KENWORTHY : Have we come to the end of the obsolete machines, and what about the contracts.

Major-Gen. SEELY : We have practically come to the end of the obsolete machines. The question of the closing of the contracts is a matter for the Minister of Munitions and not the Air Force.

* * *

The following written answers were given on May 15th :—

ROYAL AIR FORCE—4, THURLOE PLACE, SOUTH KENSINGTON.

Major LANE-FOX asked the Under Secretary of State to the Air Ministry whether the block of buildings at 4, Thurloe Place, South Kensington, recently occupied by the Central Prisoners of War Committee, was offered for sale by tender in January last, and the tender of an Army officer, crippled in the War, was accepted on February 15th, 1919, under the authority of the Government; whether the building has since been commandeered by the Air Force; and if, in view of these facts, the premises can be released by his Department and handed over to the officer who has purchased them?

Major-Gen. SEELY : The answer to the first question is in the affirmative. When the offer to sell by tender was made it was expressly stated that the premises were at the time in occupation by the War Office under the Defence of the Realm Act. As my hon. and gallant friend is no doubt aware, tenure under these Acts may last up to a maximum period of five years after the duration of the War. At the time of the sale the premises were in occupation by the Central Prisoners of War organisation, and, when vacated by them, were taken over by the Royal Air Force by arrangement with his Majesty's Office of Works in order to release hotel property in accordance with the general policy of his Majesty's Government. Unless and until suitable accommodation at a less cost to the public can be made available, I am not prepared to take any action, and I see no ground on which the officer referred to by my hon. and gallant friend can claim to have a grievance.

TIMBER FOR AEROPLANES.

Mr. REMER asked the Secretary of State for War how many machines, manufactured and partly manufactured, had to be discarded owing to cypress being found an unsuitable wood for use on aeroplanes?

Major-Gen. SEELY : No machines had to be discarded for this reason, but the substitution of other woods involved the supply of about 900 main planes, 100 main spars, and fifty-five tail planes for machines on charges of the Royal Air Force. Substitutions were also required for machines in the hands of contractors, and particulars of these are being sought for in accordance with the undertaking given to my hon Friend in answer to his previous question on the subject.

Mr. REMER asked the Secretary of State for War if he will give the names of his present advisers as to the most suitable woods necessary for use on aeroplanes; what were their pre-war occupations; and what practical experience of sawing and manufacturing timber they possess?

Major-Gen. SEELY : The Timber Committee of the Conjoint Board of Scientific Societies, in connection with the Royal Society, advises on the suitability of timber for aeroplanes. I will send my hon. friend a list of their names.

PARACHUTES.

Major PRESCOTT asked the Under Secretary of State to the Air Ministry whether his attention has been called to the verdict of death by misadventure returned by the coroner's jury at the inquest on Mr. Legh, who was recently killed in an aeroplane accident at Finchley; whether, in view of the fact that his life might have been spared had his machine been equipped with a parachute, he will so amend the Civil Air Regulations as to compel the provision of parachutes on aeroplanes used for civilian flying purposes; and whether there is any Regulation in force at the present time imposing a similar obligation in regard to Service aeroplanes as a safeguard for our airmen.

Major-Gen. SEELY : The answer to the first part of the question is in the affirmative, and as regards the second and third parts, the provision of parachutes is, as I have previously stated, receiving the closest attention of the Air Ministry, but their development has not at present reached a stage in which compulsory universal provision would be either practicable or advantageous for military or civil aviation.

* * *

The following written answer was given on May 16th :—

ROYAL AIR FORCE—DEMOBILISED MAN'S ACCOUNT.

Mr. R. McNEILL asked the Under Secretary of State to the Air Ministry if he is aware that S. R. Williamson, No. 134984, Royal Air Force, who was demobilised on January 12th, 1919, has made five applications to the paymaster, the Royal Air Force, Woking, for a copy of his accounts, but has not yet succeeded in obtaining any reply except an acknowledgment, dated March 3rd, of the receipt of one of his letters; and that, although Williamson kept strict accounts while in the Service which show that at the date of his discharge he had a credit balance of £8 10s. 3d., he has been informed that there is a debit balance against him of £8 3s. 11d.; and if he will give instructions that Williamson shall be forthwith furnished with full details of his accounts to enable him to have the discrepancy investigated.

Major-Gen. SEELY : The matter is being investigated, and instructions have been issued for a complete statement of his account to be prepared and sent to S. R. Williamson.

* * *

The following is from the "Times" newspaper, dated May 20th :—

MR. HAWKER'S FLIGHT.

On the motion for the adjournment, on May 19th,

Captain ELLIOT, in view of the great public interest in the matter, asked whether the Government had any information as to the progress of Mr. Hawker in his very gallant attempt to uphold the air supremacy of this country.

Colonel WILSON said he had taken steps to ascertain whether any information was available, and he was informed that the Government had none. He was sorry that he was not in a position to say that Mr. Hawker had arrived.

Captain ELLIOT expressed very deep disappointment with this reply. Speaking, as he thought he could to some extent, in the name of the people of this country, he wished to express the most unsparing condemnation of the Government for their action in this matter. He thought that the House, and he was sure that the country, would feel that the Government had been lamentably remiss and desperately careless of the honour of this country and of the life of a very gallant gentleman.

Mr. PRATT, Lord of the Treasury, said he could not allow the hon Member's remarks to go without a reply. He could not see in what way the hon. Member could hold the Government responsible. What the hon. Member had said would be brought to the attention of the Government at the earliest possible moment.

Captain WEDGWOOD BENN said that as the hon. gentlemen was on the Treasury Bench for the purpose of defending the Government, perhaps he would tell the House what action the Government took, whether by warnings issued or incitements offered, to get the trans-Atlantic race run. The hon. gentleman who raised the question had voiced the feeling of every one in this country of high admiration for the splendid spirit displayed by this gallant airman. Perhaps the hon. gentleman would explain what steps the Government took to assist in that enterprise

No reply was given



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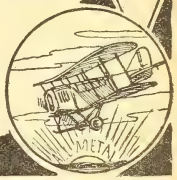
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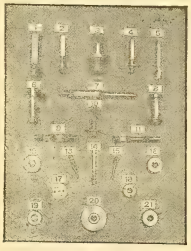
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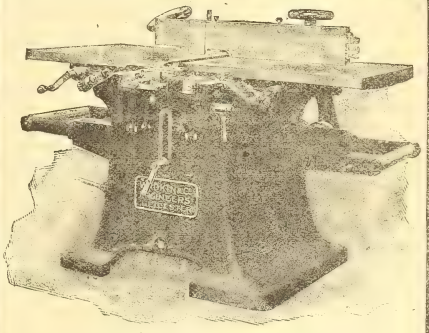
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AERONAUTICS and The LAW

A PILOT IN THE DOCK.

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"Air Heart."

The doctors, according to the papers, have contrived to create yet another disease of the nature of shell-shock. It is said to consist of a disturbance of the heart, either functional or organic, at the mere sight of an aeroplane. The patient suffers from faintness and similar symptoms of heart trouble and has usually been a spectator of a previous crash. A steep dive at the victim would intensify the symptoms and might even cause death. This announcement may be seasoned by the reader to suit his own liking, but it is of course undeniable that a sudden fright can cause illness and in some cases death.

"Putting the Gust up Them."

"Put them in fear," says the Psalmist, "that the heathen may know themselves to be but men." At the back of the aerial antics of the low-flying, crowd-diving, sensation-causing person miscalled a "stunt" pilot may lie the same proud motive; or the motive of being called a super-pilot by the heathen thus put in fear; but be the motive what it may, there is no moral justification for putting the King's lieges in peril or in fear without cause or excuse, whether they be "the Guards and such fellahs" who "use feet as propellers," or mere civilians taking the air, whether singly or in crowds.

In Terror of the Law.

But what concerns us in this column is not the righteous wrath of the victims, but the legal liability of the offender. What risk does a pilot run of being charged with murder or manslaughter who indulges in low stunting or even straightforward flying? Is he liable for frightening his passenger to death, or killing a spectator by terror?

Is he liable in dâmages in a civil court at the suit of the injured party or his dependents or representatives? What is his position with regard to sheep and other animals frightened by the passage of his craft? It is worth while to have some idea of what the law is on these and kindred subjects.

Culpable Homicide.

Homicide is the killing of one man by another. This simple fact being proved, the law starts with a presumption that the act of the person causing the death is murder; and unless the evidence given either for the prosecution or for the defence shows that the homicide was justifiable (as in war) or excusable (as in necessary self-defence), or that the absence of "malice," either express or implied, makes it manslaughter instead of murder, the homicide is murder.

The word "malice" in this sense is capable of being misunderstood. A man acts "maliciously" when he wilfully and without lawful excuse does that which he knows will injure another, even though he did it as a mere piece of mischief or so-called "practical joke"; further, he will be treated as knowing that his act will injure another if such injury is the natural consequence of the act.

For instance, a man with the intention of frightening the audience puts out the lights and blocks the exit of a theatre: in the panic which results someone is severely injured or killed, but not by the prisoner; his act is both "wilful" and 'malicious"—not that he had any personal malice against the particular individual, but in the sense that he was doing an unlawful act calculated to injure and by which others were in fact injured. If the victim of the joke dies within a year and a day he is guilty of murder (R. v. Martin).

Death from Fright.

Take first the question of death from pure fright, the victim not being touched in any way; can his death be called the act of the person causing the fright? If so, it is homicide, and if it is culpable is either murder or manslaughter according as the fright was caused with or without "malice prepense." This question, strange to relate, seems still a moot point, not clearly decided one way or the other, in spite of the march of time since first it was mooted.

Doctors Disagree.

"If a man," says Lord Hale, "either by working upon the fancy of another, or possibly by harsh or unkind usage, puts another into such passion of grief or fear that the party either dies suddenly or contracts some disease whereof he dies, though, as the circumstances may be, this may be murder or manslaughter in the sight of God, yet, *in foro humano*, it cannot come under the judgment of felony because no external act of violence was offered whereof the common law can take notice, and secret things belong to God; and hence it was that before the statute of 1 Jac., cap. 12, witchcraft or fascination was not felony because it wanted a trial."

Great as is the authority of Lord Hale on the criminal law, his statement of it on this point has not passed unchallenged. Sir Fitzjames Stephen's comment has vigour and logic. "Lord Hale's reason" for this statement" is that secret things belong to God (i.e., I suppose because of the difficulty of proof). I suspect that the fear of encouraging prosecutions for witchcraft was the real reason of this rule. Dr. Wharton rationalises the rule thus: 'Death from nervous causes does not involve penal consequences.' This appears to me to substitute an arbitrary, quasi-scientific rule for a bad rule founded on ignorance now dispelled.

"Suppose a man was intentionally killed by being kept awake till the nervous irritation of sleeplessness killed him, might not this be murder? Suppose a man kills a sick person intentionally by making a loud noise which wakes him when sleep gives him a chance of life; or suppose, knowing that a man has aneurism of the heart, his heir rushes into the room and roars in his ear 'Your wife is dead,' intending to kill, and killing him. Why are not these acts murder? They are no more 'secret things belonging to God' than the operation of arsenic.

"As to the fear that by admitting such acts are murder people might be rendered liable to prosecution by breaking the hearts of their fathers or wives by bad conduct, the answer is that such an event could never be proved. A long course of conduct gradually 'breaking a man's heart' could never be the direct and immediate cause of death. If it was, and if it was intended to have that effect, why should it not be murder?"

Died of a Broken Heart.

In a particularly atrocious case of a farmer striking his wife with a poker and turning her out of doors with circumstances of great aggravation (R. v. Murton), almost the last words the woman uttered were "The villain has broken my heart." The judge told the jury that if she died of a broken heart and from anguish at being turned out of her home it would not be a case of manslaughter, and human tribunals could take no cognizance of it as a criminal offence; "to constitute the crime of manslaughter there must have been some physical or corporal injury, negative or positive, as a blow or the deprivation of necessaries or the like." But this is *dictum*, not decision, since the jury found the farmer guilty of manslaughter by reason of his physical ill-usage of the wife.

Killing No Murder.

In his "Digest of Criminal Law" Stephen leaves the rule as Hale would have it, only qualified by an "it is said." "A person is not deemed to have committed homicide although his conduct may have caused death [it is said] when the death is caused without any definite bodily injury to the person killed." But Stephen's own opinion is reinforced by Russell on Crimes, who puts it this way: "It has been generally considered that there must be some actual corporal damage to the party. But on principle there seems no reason for holding that deliberate frightening to death is not at least manslaughter, and if a man does an act the probable consequence of which may be and eventually is death, such killing may be murder, although no blow is struck by himself and no killing may have been primarily intended."

An Indecisive Case.

The facts in Reg. v. Towers were that the accused came into a public-house rather intoxicated and on some quarrel with a young girl, who was nursing a baby of 4½ months, without touching the baby, pulled the girl's hair and made her scream. The screams so frightened the baby that it became black in the face and, later, had convulsions from the effects of which it died.

The accused was acquitted, and the only importance of the case arises from the ruling of the judge that the prisoner could be found guilty of manslaughter if the child would not have died but for the assault on the girl. "Murder," he told the jury, "cannot be committed upon a grown-up person by using language so strong or so violent as to cause that person to die. Therefore mere intimidation causing a person to die from fright by working upon his fancy is not murder," but owing to his express assumption for the purpose of his summing-up that "the law about working upon people by fright does not apply in the case of a child of such tender years as this," the judge's remarks on murder were nothing more than *dicta*.

Death from Nervous Causes.

It is therefore still a moot point, and uncertain, whether a verdict of "death from nervous causes" in the case of an ordinary adult killed by a fright maliciously or unlawfully given could be treated as a vedict of "guilty" on a charge of murder or manslaughter. Hence there is still a chance of acquittal for an air-hog who succeeds in just not touching a victim whom he frightens to death.

Fear is a Link in the Chain.

The problems which arise are quite different:—(A) If, though

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death results from nervous causes or fright, there is a definite bodily injury inflicted; or (B), if death results from a bodily injury, but fear forms a link in the chain of causation connecting the accused with the death. A few examples will make plain the point of these rather subtle distinctions.

Illustrations of (A).

(1) A, knowing that B is suffering from disease of the heart and intending to kill B, gives B a slight push and thereby kills B. A commits murder.

(2) A, in the last illustration, pushes B unlawfully but without knowledge of his state of health or intention to kill him or do him grievous bodily harm. A commits manslaughter. If A laid his hand gently on B to attract his attention and by doing so startled and killed him, A's act would be no offence at all.

(3) A, knowing that B is suffering from disease of the heart and intending to kill B, stunts with B in the air and thereby kills B. *Semble* this is not an illustration of (A), but of "death from nervous causes," and it is doubtful if A commits murder or whether it is death by misadventure.

(4) A, in the last illustration, stunts B contrary to B's orders, but without knowledge of his state of health or intention to kill him or do him grievous bodily harm. The stunt results in a crash in which B is very slightly injured. B dies of shock. *Semble*, the stunt is a trespass against B, and A commits manslaughter. If the stunt was with B's permission, which it was lawful for B to give and A to act on, A's stunting would be no offence at all.

The first two illustrations are taken from Stephen's Digest, and though there is no authority for them they are doubtless good law. (3) and (4) are the Imp's inferences which have no weight in a court of law.

The proposition these four instances illustrate is that whenever a definite bodily injury is inflicted the wrongdoer may be guilty of culpable homicide, though the immediate cause of death is a nervous affection rather than the bodily injury. It therefore seems very far from logical not to treat as homicide a death caused by an identical affection of the nerves intentionally or unlawfully produced, but by other than bodily means—as by loss of sleep, bad news, or terror of aeroplanes.

Illustrations of (B).

The second proposition—that death which results from bodily injury may be culpable homicide, although the connection of the accused with the death is traced through fear instead of violence—is illustrated (a) by cases where the actual injury is self-inflicted, and (b) by cases where it is inflicted by irresponsible agents such as animals or things.

Self-Inflicted Injury.

In R. v. Evans the indictment charged that the prisoner killed his wife (1) by beating her, (2) by throwing her out of the window, (3) and (4), in effect, by so beating and threatening her that in terror she threw herself out of the window. The three judges were of opinion that if her death was occasioned partly by the blows and partly by the fall, yet if she was constrained by her husband's threats of further violence and from a well-grounded apprehension of his doing such further violence as would endanger her life, he was answerable for the consequences of the fall as much as if he had thrown her out of the window himself.

But the jury were of opinion that she threw herself out of the window from her own intemperance and not under the influence of the threats. In one of two precisely similar cases the Lord Chief Justice laid down that "if a man creates in another man's mind an immediate sense of danger which causes such person to try to escape and in so doing he injures himself, the person who creates such a state of mind is responsible for the injuries which result."

In the other case, R. v. Curley (1909), the prisoner said to a police officer, "I ran at her to hit her. I didn't quite touch her. Out she jumped," and Jelf, J., in the Court of Criminal Appeal, said "on that statement a verdict of murder might well have been returned, but it was mercifully reduced to one of manslaughter," and the conviction was confirmed.

Lord Coleridge, J., put this case: "If a person were standing at the edge of a cliff and another were to hold up his fist before him in a fighting manner, so that he fell over and was killed, it would be a case of manslaughter against that other," and on counsel submitting that it would not be so in law unless the prisoner knew the cliff was there, Channell, J., added: "In that case it might be murder."

In another summing-up a judge said: "A man may throw himself into a river in such circumstances as render it not a voluntary act, by reason of force applied either to the body or the mind. It becomes, then, the guilty act of him who compelled the deceased to take the step. But the apprehension must be of immediate violence and well grounded by the circumstances by which the deceased was surrounded, not that you must be satisfied that there was no other way of escape, but that it was such a step as a reasonable man might take."

The Imp knows a pilot who by way of finishing his first solo on a De H.6 bounced off another machine on the tarmac before landing more normally somewhere near the T. A mechanic was on some steps at the time filling the gravity tank of the other machine, and "from a well-grounded apprehension of immediate violence" he threw himself off the top plane and slightly injured his leg. Had the pilot not been a learner doing his best, but a malicious or criminally careless person playing the ass, he would have been liable for the injury, and if death had ensued would have been guilty of murder or manslaughter.

Suicide by Arrangement.

In connection with self-inflicted injuries induced by fear, it is not irrelevant to point out that if anyone incites another person to commit suicide and such person does commit suicide, the one who incites is guilty of murder; and if two persons agree and attempt to commit suicide together, and one commits suicide and the other does not, the survivor is guilty of murder. So if a pilot and an observer were to agree to crash and die together, and the crash was so ill-judged that only one died of it, the other might carry out his part of the agreement by being hanged.

Injury Caused by Startled Animals.

"If a man or boy in the street whip his horse to put him into speed," says Hale, 'and run over a child and kill him, this is homicide and not *per infortunium*, and if he had rid so in a press of people with intent to do hurt and the horse had killed another it had been murder in the rider."

Again, "It is said," according to Hawkins, "that if a person happen to occasion the death of another inadvisedly doing any idle, wanton action which cannot but be attended with the manifest danger of some other, as by riding with a horse known to be used to kick among a multitude of people by which he means no more than to divert himself by putting them into a fright, he is guilty of murder." Hawkins gives this as an illustration of "such killing as happens in the execution of an unlawful action where no mischief was intended at all," but it seems (as Hale says) that the deliberate act ought to be to do hurt to somebody or else the killing will not be murder (R. v. Plummer).

A pilot who dived on a crowd for sport or to frighten the people, in the erroneous belief that he could avoid hurting any of them at all, would, according to Hawkins, be guilty of murdering any he killed, but according to Hale (which is the better opinion) probably only of manslaughter. Had he intended the least injury to anyone it would be murder, "though he knew not the party slain, for he had an ill-intent though that intent extended not to death."

To whip another's horse whereby he runs over a child and kills him is held to be accidental in the rider, for he has done nothing unlawful; but manslaughter in the person who whipped him, as Blackstone explains, "for the act was a trespass and at best a piece of idleness of inevitably dangerous consequence," and so it was adjudged in the case of R. v. Hickman.

On this analogy it would be culpable homicide to follow a hunt from the air and cause the death of a huntsman at the kill by diving on him for joy, thus causing his horse to throw him and bolt; and the same would be the case if cattle were similarly stampeded and trampled a child to death.

Hawkins, by the way, is extremely severe on anyone who would "go deliberately with a horse used to strike, or discharge a gun, among a multitude of people." He calls such a person "a wild beast and an enemy to mankind in general."

(To be continued.)

LOW FLYING.

The following is taken from the "Daily Express" of May 19th:—

A new and serious problem for cricketers has been created by the popularity of civilian flying.

At Lord's on Saturday, just when George Gunn and Lee, the Nottinghamshire batsmen, were nearing centuries, a giant Handley Page swept across the ground at a very low level, the roar of the engines completely disconcerting the players and causing a temporary stoppage of the game.

It was remarkable that Lee, who before had seemed firmly set, misplayed a ball a few overs later and was caught at the wicket. In the opinion of many spectators his downfall was due to the disturbing effect of the aeroplane.

On several occasions later during the afternoon other Handley Pages paid their unwelcome visits, the pilots evidently desiring to give their passengers close views of a Lord's cricket match from the air.

The umpires seemed no less disconcerted than the players. They could not very well order the aeroplanes off the field, for they were not actually on it, and even if they had the power they had no means of conveying warning messages to the aerial offenders.

Old cricket enthusiasts in the pavilion seats shook their heads and declared that the question of who owns the air over Lord's must be settled without delay.

Otherwise, when flying becomes still more popular, they foresaw such a series of alarming interruptions that serious cricket would become almost impossible.

AEROPLANE SALVAGE.

One of the most interesting of many well-meant attempts by Government Departments to save the money of the British taxpayer is that of the Salvage Department of the Air Group of the Ministry of Munitions—which Ministry apparently hopes some day to be a Ministry of Supply. Something has already been written of the work of the Aircraft Salvage Department offices in Kingsway. As a supplement to those notes one may now record that much salved material is being stored at the demobilised National Aircraft Factory at Whaddon, near Croydon.

Considered as a store the place is excellent. Captain Sperling, who is in command, has unusual organising powers, and combines with them very considerable ingenuity, as is proved by the clever mechanical arrangement of the aeroplanes and engines sent to Whaddon for storage. At any rate, the taxpayer's money will not be wasted through bad storage, bad handling, or bad arrangement of the aeroplanes, engines, and parts in his care.

Whether the place is ever likely to pay for its upkeep as a business proposition is a matter on which one would not care to express an opinion. It seems to depend entirely on whether there is a real market for the goods in store. Perhaps the position is best described in a letter from one who visited the store lately. The letter reads thus :—

" One presumes that the Salvage Stores at Whaddon were intended to save that most sacred and all-important Government deity, the Public Money. Which is a pity, because, as such at any rate, as far as one can see, they cannot succeed in their purpose. Not that that is the fault of Captain Sperling and his various assistants, for their work is carried on in a most exemplary manner.

" All the mess that comes along (which seems to be really mess, for the most part) is dumped in one of six hangars or a large workshop. The hangars are presumably to be moved some day, or devoted to other purposes, but the shop is a fixture, being somewhat too large and of too solid a nature to fold up and go into one's waistcoat pocket, and is to contain aeroplanes —minus the engines—stacked in the most harmless (to the machines) and economical manner possible. Various experiments in methods of storing the machines have been carried out, and from them wonderful calculations as to cubic space occupied have been made, so it seems probable that the best method has been discovered.

" At the present there are some D.H.9s (Airco 9s if preferred), S.E.5s, and Avros stored. They look very beautiful and orderly, and it is possible to get at any one of them without carting out all the other stock. In fact, any desired machine can be extracted by moving three others. There are, in addition to the afore-mentioned three types of machines, some Ack-Ws, D H.9as, and Bristol fighters; also a couple of Handley Pages, remnants of the days when those animals used to be assembled there.

" Besides aeroplanes there are all manner of breeds and types of engines, all of which apparently go on a standard pattern support made out of otherwise useless material, such as scrapped wing-spars. In time the engines are all to be classified, cleaned, and stored, complete with pedigree and tale of wants and deficiencies. At present this has not gone very far.

" The Salvage Stores likewise keep the little bits of mess. These are all put into drawers (if small enough, otherwise they are stored in some other way) and can be found easily. What is absolutely useless is converted into raw material, and is to be sold as such.

" And every week a list of everything with which the place has dealt is furnished to Headquarters. So one can't criticise the methods employed—unfortunately (!).

" The principle, however, as a money-making affair seems unsound. There is likely to be a market for the domesticated and tamed aeroplane accessories, such as cushions, garden chairs, and tanks (not the walking type). Also there is likely to be a market for the raw material. And there may be a market for some of the tamer aeroplanes and some of the better aero-engines. And possibly, if they wait long enough, and the place is not burnt down by Bolshevists as a home of capital and authority, quite a large one for the spare parts.

" But there will be an awful lot that will just have to sit there till it rots, for one would not imagine that such machines as those of the daylight bomber type would become popular with the amateur who is in the habit of making forced landings. Neither would one imagine that many of the types of engines would become popular with anybody on the ground or above it. And it seems as if the price obtained for what is sold would fall some considerable distance short of the sums spent in wages.

" If, however, one might consider it as a kind of national charitable institute for disabled soldiers—which it really is, for it gives them a little work and much reward for it—the Salvage Depot at Whaddon would be a most praiseworthy and altogether admirable enterprise.

" That, however, would be against all the principles of a fatherly Government which saves its sons' money for itself and the use of its members. Besides, who ever heard of a British Government that rewarded men who fought for it and happened to be so foolish as to incapacitate themselves in so doing? The principle of doing so would be wrong, and would encourage recklessness.

" So the Salvage Stores had better be left as an example of Government operation which is very much less wrong in management than most."

Such is the view of one who is no respecter of Governments—at any rate of the modern kind. Naturally the store is not a money-making concern, but it is an earnest of effort to turn goods for which the nation has paid x millions of pounds into at any rate x thousands of pounds instead of x hundreds of pence. That is to say, by skilful storing and handling, an aeroplane which costs, say, £4,000 may be sold for a few hundreds of pounds, instead of being " reduced to produce " and sold as scrap metal and firewood for a few shillings.

Meantime the work of the stores is chiefly being done by disabled soldiers, many of them minus a leg or both legs. The worst cases are employed in sorting out the small parts of dissembled aeroplanes. The more able-bodied handle the machines and bigger parts. Some of them have done good work in building the standard-type engine racks out of sawed-off spars of condemned wings.

Apropos which it is of interest to note that the loyal and grateful woodworkers of the district have been threatening to strike because the smashed-up soldiers who are using saws, chisels, hammers, and screwdrivers are being taught to become " skilled men " within the Trade Union acceptance of the term. Apparently the good Trade Unionists are afraid lest these poor disabled lads shall be able to earn a living by hard work, and so oust from their position the trench-dodging slackers who stayed at home and drew big wages while the others lived perilously and fought gallantly to protect this country from invasion. It is on such occasions that one feels sorry that the Huns did not win the war. They, at any rate, would be no respecters of Trade Unions in a conquered country.

In any case, there is the store, and by it is an excellent aerodrome, so that the buyer of an aeroplane may test his mount before taking it away. These Stores are doing their best to salve some of the usable material, for the sake of the taxpayer's pocket, and for that one must be duly thankful.

AN AIRCRAFT SERVICE

On Saturday General Sir W. S. Brancker flew to Harrogate to meet the Mayor of Harrogate to discuss the question of the Aircraft Transport and Travel, Ltd., establishing an aerial service between London and Harrogate

General Brancker, who was piloted by Major Patteson, left Hendon in a three-seater Airco 9 at 9.45 a.m., arrived at Doncaster at 11.15 a.m., and took a further half-hour to reach Harrogate. The return trip, starting at 5.15 p.m., was made in 2 hours 10 minutes, thus enabling a further appointment to be kept in the evening.

It is interesting to note that had this trip been carried out by train, it would not have been possible to have got back to London before Sunday morning, and this would have involved travelling all night.

It is also interesting to note that this was the first machine to land at the Doncaster Aerodrome and make use of the facilities afforded by the R.A.F. there for commercial purposes.

EASTBOURNE ARRANGEMENTS

The Eastbourne Aviation Co., Ltd., have fixed up flying contracts at Eastbourne, Bexhill and Worthing, and other seaside resorts will be added to the list shortly. Seaplanes of the 184 Short and Avro types will be used for the work, which is expected to start about the middle of next week.

Major F. B. Fowler (late R.A.F.), who is Managing Director of the Eastbourne Aviation Company, is one of the pioneers of British aviation, and it is certain that any concern which is run under his management will be conducted on the safest and most satisfactory lines.

A GOSPORT TEST

The first " F.5 " type flying boat with a span of 105 ft., fitted with two 350-h.p. Eagle Rolls-Royce, and built complete by the Gosport Aircraft Company, was successfully launched on Friday afternoon, 16th inst., and towed from the erecting sheds at Northam down the river to Southampton Water.

After a preliminary taxi round to warm up the engines, she got off with a short run of only about 60 yards, with a load of 190 gallons of petrol and a crew of five, including Mr. Charles Nicholson, a director, and Mr. M. H. Volk, engineer and general manager to the firm.

After carrying out in a most satisfactory manner the official test flight of about 35 minutes' duration, the passengers were disembarked and the machine was delivered by air to an East Coast air station the same evening.

NAVAL & MILITARY AERONAUTICS

FROM THE "LONDON GAZETTE."

AIR MINISTRY, May 13th.

R.A.F.—The following temp. appointments are made:—Staff Officer, 2nd Cl.—(Q) Capt. C. A. Shaw, D.S.O., relinquishes the actg. rank of Lt.-Col., and to be actg. Maj. (from March 15th to April 30th), vice Lt. (Hon. Capt.) G. W. Frost.

Staff Officer, 3rd Cl.—(Air) Sec. Lt. T. J. O. O'Hara, May 7th.

FLYING BRANCH.—Capt. (actg. Maj.) T. F. Harel, D.S.O., M.C., D.F.C., to be Capt. (A.), and relinquishes the actg. rank of Maj., April 2nd.

Sec. Lt. M. G. Stewart (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt. (O.), April 23rd, 1918.

Sec. Lt. F. G. Gage (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt. (A.), July 15th, 1918.

P.O. H. L. Buckley (late R.N.A.S.) is granted a temp. commn. as Sec. Lt. (A. and S.), Oct. 12th, 1918.

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. J. H. Lowry, Oct. 7th, 1918; Lt. A. L. Stover (Lt., Manitoba R.), Dec. 13th, 1918; Lt. N. R. D. Henderson (Lt., Manitoba R.), Jan. 26th; Lt. (Hon. Capt.) W. D. Spero, Feb. 3rd; Lt. (actg. Capt.) J. A. Adam (Lt., B. Col. R.), Feb. 6th; Sec. Lt. (Hon. Lt.) C. F. Mee (Lt., Can. Fr. Art.), Feb. 11th, Sec. Lt. (Hon. Lt.) A. R. Beveridge (Lt., C. Ont. R.), March 15th; Lt. A. N. Jenks (Lt., Quebec R.), Lt. E. A. Plamondon (Lt., W. Ont. R.), March 17th; Lt. (Hon. Capt.) B. B. Bishop (Capt., Can. A.S.C.), Lt. F. L. Barclay (Cent. Ont. R.), March 18th; Sec. Lt. (Hon. Lt.) G. A. F. Riley (Lt., Nfld. R.), Sec. Lt. J. D. Menendez (Lt., R. Regt. Art.), March 24th; Lt. R. F. Given (Lt., C. Ont. R.), Lt. H. C. McKinney (Lt., Quebec R.), Capt. V. E. Schweitzer (Capt., Manitoba R.), March 31st; Capt. G. R. L. Snow (Lt., R.N.), April 4th; Sec. Lt. (Hon. Lt.) C. E. Rattee (Lt., N. Brunswick R.), April 9th; Lt. C. A. Chisnall (Lt., Alberta R.), April 13th; Lt. R. M. Roberts (Lt., B. Col. R.), April 16th; Sec. Lt. (Hon. Lt.) L. K. McKenna (Lt., F. Ont. R.), April 25th.

Transferred to unempld. list:—Lt. G. Walker, Feb. 1st; Sec. Lt. J. Woods, Feb. 2nd; Sec. Lt. L. Eteson, Feb. 5th; Lt. G. E. W. Stevens, M.C. (E. Kent R., T.F.), Feb. 12th, Sec. Lt. A. Makins, Feb. 13th; Sec. Lt. E. C. Parkinson, Feb. 14th; Lt. J. G. De Roper, Feb. 17th; Lt. L. Davidson, Feb. 21st; Lt. G. B. Beatty, Feb. 28th; Lt. L. G. Legge-Wilkinson, Sec. Lt. A. L. Spracklin, March 1st; Sec. Lt. D. Macrae, March 5th, Lt. F. W. Pickup, D.F.C., March 8th; Lt. L. O. G. Whitefield, March 9th; Sec. Lt. G. Grainger, March 13th; Sec. Lt. G. K. Berry, March 15th; Lt. E. L. Wilson, March 24th; Sec. Lt. (Hon. Lt.) J. H. Partridge, Lt. W. J. White, March 26th; Lt. W. M. Phillips, March 27th; Lt. D. N. Reid (High. L.I.), March 28th; Sec. Lt. U. P. Perring, March 31st; Sec. Lt. A. G. Middleton, April 1st; Capt. F. J. Morse, April 2nd; Lt. R. S. Park, April 3rd; Lt. F. B. Pelly, Lt. (Hon. Capt.) (actg. Capt.) C. T. Philcox, D.F.C., April 4th; Lt. E. B. Hamel, Sec. Lt. T. W. H. Pearce, April 5th; Sec. Lt. J. C. Dalton, Lt. R. W. King, Capt. D. H. Robertson, A.F.C., April 6th; Sec. Lt. F. G. Miller, Sec. Lt. W. J. Peters, Lt. (Hon. Capt.) (actg. Capt.) W. Petre, April 7th; Lt. A. G. Fisher, Sec. Lt. F. J. Frape, Capt. (actg. Maj.) G. D. Gardner, M.C., Sec. Lt. H. A. Pank, Sec. Lt. H. Parsons, Sec. Lt. E. H. Peet, April 8th; Lt. W. E. Capley, Lt. G. J. Fowler, Lt. H. J. Griffiths, Sec. Lt. (Hon. Lt.) R. J. McNab, Sec. Lt. C. Hamilton, Lt. A. E. Pemberton, D.F.C. (actg. Capt.) W. S. Philcox, Sec. Lt. C. C. S. Preston, Lt. A. G. Taylor, Sec. Lt. W. R. Usher, Lt. W. Woodstock, April 9th; Sec. Lt. L. F. Cubitt, Sec. Lt. G. E. Davies, Sec. Lt. N. B. Harris, Sec. Lt. E. U. Hargreaves, Sec. Lt. N. F. Moxon, Lt. H. R. Owen, Sec. Lt. H. L. Page, Sec. Lt. A. Parsons, Sec. Lt. W. R. Prebble, Sec. Lt. J. R. Pritchard, Sec. Lt. H. Pullan, D.F.C., April 10th; Sec. Lt. G. M. Possick, Sec. Lt. E. H. De Heaume, Sec. Lt. R. McI Gordon, D.F.C., Lt. L. W. Lowen, Sec. Lt. A. J. C. Overal, Lt. W. R. Patey, D.F.C., Lt. L. Patterson, M.C., Lt. T. F. Pilcher, Lt. J. N. Rutter, April 11th; Lt. J. T. Cameron, Sec. Lt. C. H. Cook, April 12th; Sec. Lt. T. L. Calvert, Sec. Lt. A. F. Head, Lt. C. E. Iacoson, Sec. Lt. E. McKay, Capt. L. E. Hughes, Lt. W. R. Mawhinney, Lt. M. Mullen, Sec. Lt. R. H. Paterson, Sec. Lt. H. W. Penner, Sec. Lt. E. G. Peter, Lt. (actg. Capt.) J. Phillips, Lt. V. G. H. Phillips, Lt. M. H. Press, Sec. Lt. J. A. G. Smith, Lt. W. Steer, Lt. T. F. Steele (Arg. and Sutherd Highrs.), April 13th; Lt. E. J. N. Brown, Lt. J. C. Clark, Sec. Lt. J. Glen, Lt. A. J. M. Mcclintock, Sec. Lt. G. A. May, Lt. A. J. Partridge, Capt. R. M. Plumridge, Lt. J. M. Todd, D.F.C., April 14th; Sec. Lt. R. J. Bunning, Sec. Lt. J. P. Coleman, Lt. C. S. Frowd, Sec. Lt. R. Foy, Sec. Lt. J. Gerrard, Lt. O. S. Neill, Sec. Lt. (Hon. Lt.) J. S. Olinhant, Sec. Lt. G. E. Page, Lt. B. H. Parnham, Sec. Lt. W. J. Parker, Lt. N. E. Faikes, Sec. Lt. A. Patchett, Sec. Lt. B. Patterson, Capt. H. S. Peck, Sec. Lt. L. Pendlebury, Lt. C. B. Percy, Sec. Lt. C. T. Perrins, M.C., Lt. J. A. Pugh, Sec. Lt. T. W. Sleigh, Lt. F. E. Wyett, April 15th; Sec. Lt. C. H. Bizzell, Lt. B. Brewer, Sec. Lt. A. E. Chadwick (Durh. L.I.), Sec. Lt. G. Campbell, Maj. C. S. Duffus, O.B.E., M.C., Sec. Lt. W. A. Owens, D.F.C., Sec. Lt. L. A. R. Stedefond, Lt. F. E. Stammers, Capt. R. L. Truelove, Sec. Lt. C. Workman, Capt. F. W. Walker, D.S.C., A.F.C., Sec. Lt. H. A. Wessels, April 16th; Lt. A. R. Anthony, Lt. S. A. Bond, Sec. Lt. J. Boughey, Lt. F. Daltrey, Sec. Lt. F. T. Gregory,, Sec. Lt. J. H. Guest, Sec. Lt. A. G. Palin, Lt. F. L. Pascoe, Lt. (actg. Capt.) E. F. Peacock, M.C., Capt. L. V. Pearkes, Captain A. C. Teesdale, April 17th; Captain P. E. Beasley, Sec. Lt. G. Cunningham, Sec. Lt. F. Coutts, Sec. Lt. N. E. Mustoe, Capt. J. P. R. Napier, M.C., Lt. S. McC. Peterkin, Lt. K. F. Piper, Sec. Lt. G. Todd, Sec. Lt. F. H. Turrell, April 18th; Sec. Lt. V. P. Donald, Sec. Lt. R. C. Love, Sec. Lt. A. H. Partner, Sec. Lt. W. A. Sabine, (Notts and Derby R.), Lt. J. B. Young, April 19th; Sec. Lt. (Hon. Lt.) C. Brown (R.O.S.B., T.F.), Sec. Lt.,(Hon. Lt.) F. T. Howell, Sec. Lt. J. L. McI. Oliphant, Sec. Lt. J. Pendlebury, Lt. G. F. Petch, Lt. F. R. Presland, Sec. Lt. J. Pritchard, April 20th; Sec. Lt. (Hon. Lt.) P. M. Ashton, Maj. (actg. Lt.-Col.) W. S. Douglas, M.C., D.F.C. (R.F.A.), Sec. Lt. H. C. Glassford (substituted for notification in "Gazette," April 26th), Lt. F. T. Maitland, Sec. Lt. C. H. B. Price, Sec. Lt. N. J. Spencer, Sec. Lt. T. Stewart, Sec. Lt. A. D. Watson, Sec. Lt. J. F. Wilby, April 21st; Sec. Lt. (Hon. Lt.) G. M. Ashmore, Sec. Lt. H. J. Challis, Lt. P. O. Davies, Sec. Lt. O. S. Evans, Sec. Lt. S. M. Farrell, Capt. R. W. Greenwood, Sec. Lt. S. Hammersley, Sec. Lt. H. H. R. Hanford, Sec. Lt. R. Mumford, Lt. A. V. Roger, Lt. L. A. Wykes, April 22nd; Sec. Lt. C. A. Atkins, Lt. D. H. Bridger, Sec. Lt. H. J. Clements, Lt. C. V. Clayton, Sec. Lt. B. Garrett, Sec. Lt. L. E. Gosden, Sec. Lt. E. E. Baskcombe-Harrison, Lt. D. H. Morris, Lt. J. S. Nicoll, Sec. Lt. R. W. Sinclair, Lt. (Hon. Capt.) G. W. Salt, Lt. G. E. Tennant (Yorks Hus., T.F.), Sec. Lt. A. C. Trowse, R.F.A., Lt. E. McL. Watson, April 2nd; Sec. Lt. C. F. Abbott, Lt. A. J. Bateman, Capt. (actg. Maj.) E. N. Clifton, Sec. Lt. T. H. A. Christie, Lt. F. B. G. Castleman, Sec. Lt. E. Dodgson, Sec. Lt. W. B. Esplen, Sec. Lt. J. R. Ferguson, Sec. Lt. J. C. Fairbairn, Lt. C. R. Gooding, Lt. W. C. Goudie, Sec. Lt. G. W. Green, Sec. Lt. G. C. Gage, Sec. Lt. F. McE. Gorman, Lt. G. F. Hyams, D.F.C., Sec. Lt. W. G. McGregor, Sec. Lt. J. M. May, Sec. Lt. N. W. McLellan, Capt. L. M. Martin-Jones, Sec. Lt. E. Mulcair, Lt. J. B. Mulvey, Lt. E. C. Potter, Sec. Lt. F. J. P. Pearce, Sec. Lt. M. N. Pegg, Sec. Lt. F. A. Pringle, Sec. Lt. H. B. Roy, Sec. Lt. J. W. Shand, Lt. H. McD. Sinclair, Lt. E. R. Tundell, Lt. F. E. Vipond, Sec. Lt. C. S. Wolton, Sec. Lt. P. H. B. Wood, April 24th; Sec. Lt. S. L. G. Beaufoy, Lt. D. A. Buchanan, Sec. Lt. C. F. Currington, Capt. J. F. Chisholm, D.S.C., D.F.C., Sec. Lt. J. R. Chisman, Lt. K. C. Cleaver, Sec. Lt. F. H. Cooper, Lt. C. R. Duggan, Sec. Lt. W. Mills, Sec. Lt. W. C. Nelson, Lt. H. Oldham, D.F.C., Sec. Lt. W. F. H. Parish, Lt. G. W. McA. Paterson, Lt. C. J. Pell, Capt. P. Pralie, Sec. Lt. J. H. Spracklin, Capt. W. H. Strettall-Miller, April 25th; Sec. Lt. D. A. Allan, Sec. Lt. R. M. Alston, Lt. F. R. Allen, Lt. P. K. Chapman, Sec. Lt. E. C. Coombes, Lt. (actg. Capt.) H. R. W. Ellison, D.F.C., Lt. H. R. Gates, Sec. Lt. C. R. Gains, Lt. M. G. Hallowes, Capt. N. C. Harrison, Sec. Lt. R. K. Hodges, Lt. C. H. Rice (Oxf. and Bucks), Sec. Lt. J. F. A. Segner, Sec. Lt. J. S. Swales, Sec. Lt. A. E. R. Trotman, Lt. A. Wedge, April 26th; Sec. Lt. H. C. Comben, Sec. Lt. G. Goodall, Lt. J. C. McCormick, Lt. P. R. Moore, Sec. Lt. R. A. Nicholas, Sec. Lt. P. S. Primrose, Sec. Lt. G. P. Smith, Lt. (actg. Capt.) L. R. Shoebottom, D.F.C., Sec. Lt. E. H. Sparshott, April 27th; Capt. P. E. Bayley, Sec. Lt. W. Blacklaurn, Sec. Lt. A. Dixon, Sec. Lt. A. S. Fletcher, Sec. Lt. L. C. Le Maitre, Sec. Lt. F. E. A. MacDonnell, Sec. Lt. H. Mason, Sec. Lt. R. Niven, Lt. F. Planche-Hearn, Lt. E. A. Sawyer, Sec. Lt. W. N. V. Someren, April 28th; Lt. S. Adams, Sec. Lt. W. K. Buchan, Lt. R. Buchanan, Lt. A. H. Carman, Sec. Lt. C. S. Clarke, Sec. Lt. V. A. Cremer, Capt. P. E. A. Dash, Sec. Lt. F. H. Davidson, Lt. C. S. Devereux, Sec. Lt. H. W. Diss, Sec. Lt. G. Matthews, Lt. H. R. Milton, Lt. (actg. Capt.) J. D. D. Northwood, Lt. H. Nuttall, Capt. (actg. Maj.) A. H. Peck, D.S.O., Lt. W. E. Pepper, Sec. Lt. H. W. Phillips, Lt. (actg. Capt.) H. J. Pratt, Lt. H. C. Ridler (Lond. Yeo., T.F.), Lt. W. H. Relett, Sec. Lt. J. D. Sinclair, April 29th; Capt. T. P. M. Alexander, Sec. Lt. (Hon. Lt.) G. A. Brook, Lt. M. P. Blake, Lt. T. M. Bevan, Sec. Lt. T. W. Blaxter, Capt. (actg. Maj.) C. J. W. Crichton, Sec. Lt. H. O. Cuffe, Sec. Lt. C. W. Daggett, Sec. Lt. G. R. A. Dick, Sec. Lt. W. J. Diment, Lt. W. L. McIlwraith, Sec. Lt. (actg. Capt.) H. D. McLaren, D.F.C., Sec. Lt. J. R. Moorhouse, Sec. Lt. V. H. C. Pennell, Lt. H. M. Strachan, Sec. Lt. W. E. Warcoe, Sec. Lt. A. W. Weeks, April 30th; Lt. (actg. Capt.) L. B. Blagrave, Capt. A. T. Barker, D.F.C., Sec. Lt. L. G. Cole, Lt. T. E. Duffy, Sec. Lt. N. P. Field, Sec. Lt. B. E. Harmer, Lt. A. W. Martin, Lt. (actg. Capt.) W. H. Muirhead, Sec. Lt. J. St. G. B. Nolan, Sec. Lt. J. C. Paler, Lt. A. Perren, Sec. Lt. F. H. Pidgeon, Lt. T. Shepard, Capt. O. H. Weekes, Sec. Lt. I. A. Wright, May 1st; Sec. Lt. A. Ascott, Lt. G. L. Barrett-Hamilton, Sec. Lt. E. Coult, Sec. Lt. (Hon. Lt.) C. R. Cook, Lt. J. J. Cox, Lt. G. D. Crowther, Lt. F. A. D. Gauntlett, Sec. Lt. W. J. Guppy, Sec. Lt. F. L. McHenry, Sec. Lt. J. H. Matthews, Lt. W. B. Mattinson, Lt. S. E. Meering, Sec. Lt. C. E. Merrett, Lt. C. E. Neath, Sec. Lt. M. Nicol, Sec. Lt. W. Mylam, Lt. V. N. R. Price, Sec. Lt. W. T. Richards, Capt. W. E. Winterbottom, May 2nd; Lt. F. H. Courtney, Lt. (actg. Capt.) P. Carpenter, D.S.O., M.C., May 3rd; Lt. C. E. Mott, Lt. D. B. Wooley, May 4th; Maj. B. C. Bell, D.S.O., D.S.C., Maj. V. D. Bell, O.B.E., May 6th; Sec. Lt. W. A. Allen, Sec. Lt. W. I. Boddy, Sec. Lt. O. H. Bertrand, Sec. Lt. O. H. Campbell, Sec. Lt. S. W. Gee, Lt. D. K. Glen, Sec. Lt. E. L. Millen, Sec. Lt. A. Mitchell, Sec. Lt. D. A. Murray, Sec. Lt. J. A. Simmers, Sec. Lt. H. Wearne, May 8th; Lt. H. V. Barker, Sec. Lt. F. D. Cowan, Sec. Lt. F. W. Chambers, Sec. Lt. P. W. Ford, Sec. Lt. A. S. Farquhar, May 9th; Lt. F. A. Pumphrey, Sec. Lt. M. D. McTaggart, May 10th; Sec. Lt. J. F. Cavanagh, Sec. Lt. F. C. Shirtcliffe, May 12th; Lt. J. W. D. Melhuish, M.C. (Worc. R.), May 13th.

The following Lts. relinquish their commns. on account of ill-health and are permitted to retain their rank:—E. F. Driver, April 1st, 1918 (substituted for notification in "Gazette," Jan. 7th); J. St. G. George (N. Staff. R.), May 3rd.

Lt. H. L. Yates resigns his commn., May 14th.

Sec. Lt. L. F. Chisenhall relinquishes his commn on account of illhealth contracted on active service and is permitted to retain his rank, April 25th.

Sec. Lt. H. A. Bradshaw to take rank and prec. as if his appointment as Sec. Lt. bore date March 7th.

The initials and rank of Sec. Lt. F. H. J. Bull are as now described and not Lt. F. J. A. Bull as stated in "Gazette," Feb 28th.

The notification in "Gazette," March 28th, concerning Sec. Lt. H. R. Hanford is cancelled.

The notification in "Gazette," April 4th, concerning Sec. Lt. N. V. Scott is cancelled.

ADMINISTRATIVE BRANCH.—Lt (actg. Capt.) C. G. Darwin, M.C. (R.E.) is granted a temp. commn. as Lt., and to be actg. Capt. while so empld., May 22nd, 1918.

Lts. (A.) to be Lts.:—T. H. Butler, April 1st, 1918 (substituted for notification concerning this officer which appeared in "Gazette," Feb. 21st; R. N. Swann, April 24th; C. J. Gillan, April 26th.

H. J. W. Fletcher (Lt., Northants R.) is granted a temp. commn. as Lt., Oct. 4th, 1918, seny. from April 1st, 1918.

Lt. J. A. Stedman (R.F.A., T.F.) is granted a temp. commn. as Lt., Oct. 28th, 1918 (substituted for notification concerning this officer which appeared in "Gazette," Jan. 7th).

Sec. Lts. to be Sec. Lts. from (A.):—H. West, Dec. 7th, 1918 (substituted for notification in "Gazette," Feb 14th); H. E. Barry, S. D. Connolly, N. F. Hoxie, F. H. Lane, W. P. Taltavall, April 17th; H. V. A. Salter, April 26th.

Sec. Lt. H. Castle-Mason to be Sec. Lt., from (A. and S.), April 17th.

Sec. Lts. to be Sec. Lts., from (O.):—G. F. Sharp, Nov. 22nd, 1918 (substituted for notification in "Gazette," Feb. 4th); E. C. Richards, April 17th; W. Robinson, April 28th; H. Cahill, April 29th.

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. E. B. Sprowson, July 13th, 1918; Lt. S. H. H. Beaver (Ches. R.), Feb. 10th.

Transferred to unempld. list:—Capt. (actg. Maj.) C. H. Biddulph Pinchard, March 1st; Sec. Lt. G. H. Lilley, March 5th; Sec. Lt. R. N. Playford, Sec. Lt. E. A. Scanes, March 30th; Lt. M. Weinberg, March 31st; Lt. F. Pascoe, April 3rd; Lt. C. E. Worthington, April 4th; Sec. Lt. E. Edwards (W. Yorks R.), April 12th; Lt. F. C. Rider, April 13th; Sec. Lt. W. C. Osborn, Sec. Lt. R. Wallace, April 14th; Sec. Lt. H. C. Chaplin, Sec. Lt. R. H. McLean, Sec. Lt. H. S. Mullen, Sec. Lt. (actg. Capt.) W. H. Nankivell, Lt. R. T. Penn, April 15th; Lt. (Hon. Capt.) J. F. C. Bennett, Sec. Lt. E. W. Deane, Sec. Lt. W. L. Eveleigh, Sec. Lt. A. F. Perkins, April 16th; Sec. Lt. F. W. P. Clark, Lt. F. Neall, Sec. Lt. T. R. Price, April 17th; Sec. Lt. T. F. Bunce, April 19th; Sec. Lt. F. Warham, April 22nd; Capt. S. C. Godfrey, M.C., Sec. Lt. V. H. Nunn, Lt. F. Wilkinson, April 23rd; Maj. R. C. Burton, Sec. Lt. W. H. Hadfield, Lt. J. C. L. Mercer, Sec. Lt. F. G. Norman, Lt. J. L. Gerren, Lt. B. R. Perry, April 24th; Capt. W. F. Corfield, M.C., Lt. (Hon. Capt.) F. Dickinson, Sec. Lt. R. M. Doyle, Lt. L. W. Williams, D.S.O., April 25th; Sec. Lt. H. Chambers, Capt. R. E. H. Daniel, April 28th; Sec. Lt. J. Muir, Sec. Lt. V. D. Phillips, Lt. H. W. Piper, Lt. J. E. Price, April 29th; Sec. Lt. O. F. Bendall, Sec. Lt. W. D. Farrer, Sec. Lt. (Hon. Lt.) (actg. Capt.) R. J. R. Farrow, Sec. Lt. L. H. Pallister, April 30th; Lt. (actg. Capt.) L. E. Beales, Lt. (Hon. Capt.) J. W. Cook, Sec. Lt. W. H. Gardner, Sec. Lt. F. N. McDowell, Lt. (Hon. Capt.) F. F. McKenna, Maj. H. A. R. Norton, May 1st; Capt. R. Oxspring, M.C. (Yorks L.I.), Sec. Lt. H. A. Bartlett, May 2nd.

Sec. Lt. S. R. S. Barnett relinquishes his commn. on account of ill-health and retains his rank, May 6th (substituted for notification in "Gazette," Feb. 18th).

The surname of T. W. B. Hill is as now described and not T. W. B. Mill as stated in "Gazette," Feb. 4th.

The Christian name of Wilfred Bolt is as now described and not as stated in "Gazette," Jan. 31st.

The name of Sec. Lt. E. J. Syer is as now described and not as stated in "Gazette," March 25th.

The notification concerning Sec. Lt. W. Pollock which appeared in "Gazette," Feb. 11th, is cancelled.

The notification in "Gazette," April 18th, concerning Sec. Lt. G. Jacob is cancelled.

The notification in "Gazette," May 2nd, concerning Lt. H. B. Turner is cancelled.

TECHNICAL BRANCH.—Capt. (actg. Maj.) W. B. Cushion to be Maj., Grade (B), from (AD), May 6th, 1918.

W. J. F. Dutson (actg. Lt., R.N.V.R.) is granted a temp. commn. as Capt., April 1st, 1918 (since demobilised).

Lt. H. K. Gibson (Grade (B)), from (ND), Feb. 20th.

Sec. Lt. J. F. Groom to be Sec. Lt., Grade (A), from (AD), March 7th.

Sec. Lts. to be Sec. Lts., Grade (B), from (AD):—D. Morton, Feb. 19th; J. H. Payne, Feb. 21st.

Lt. (Hon. Maj.) C. G. C. Hamilton, M.P. (Maj., Lon. R., T.F.), relinquishes his commn. on ceasing to be empld., Jan. 31st.

Transferred to unempld.:—Capt. W. Pollock, Jan. 25th; Sec. Lt. G. A. H. Wootton, March 23rd; Maj. R. J. F. Briggs, Lt. J. S. Sutherland, March 31st; Lt. (actg. Capt.) D. R. Pye, April 1st; Lt. D. J. Parry, April 2nd; Sec. Lt. C. A. Pierpoint, Sec. Lt. J. Sewell, Capt. (actg. Maj.) R. V. Wynn, April 3rd; Lt. (actg. Capt.) A. S. F. Morris, Lt. D. S. Parsons, April 5th; Lt. P. Page, April 9th; Sec. Lt. L. H. S. Hardy, Capt. (actg. Maj.) F. A. Mike, April 10th; Lt. J. L. Monahan, Lt. M. Platt, April 11th; Lt. (actg. Capt.) F. Freeman, Capt. G. A. Lawlor, April 12th; Capt. S. C. Perryman, April 14th; Lt. C. J. Geddes, Sec. Lt. S. R. Lewis, Lt. J. E. Marriott, Sec. Lt. B. Moore, Lt. R. M. Pegge, Sec. Lt. E. S. Robilliard, Lt. A. H. Stevens, April 15th; Capt. L. Murphy, Lt. J. T. Thornhill, April 16th; Sec. Lt. J. A. Currie, Sec. Lt. H. G. Murphy, Sec. Lt. A. Musgrave, Sec. Lt. C. T. Parker, Sec. Lt. H. R. Stobbington, April 17th; Sec. Lt. A. D. Goodwin, Sec. Lt. J. Morris, Maj. T. Worswick, April 18th; Lt. H. L. Soulsby (R.H. and R.F.A., T.F.), April 20th; Lt. (actg. Capt.) R. J. Paton, April 21st; Capt. Lt. H. M. Bennett, April 22nd; Sec. Lt. D. Batwell, Sec. Lt. T. Doré, Lt. I. S. Thomas, April 23rd; Capt. A. C. Gilling, Capt. J. C. Murray, Sec. Lt. A. C. Nash, Lt. R. H. New, Lt. L. Norris, Maj. J. E. Rendle, April 24th; Sec. Lt. A. W. H. Clarke, Capt. S. W. Cooper, Lt. W. G. Foulds, Sec. Lt. (Hon. Lt.) P. H. Wellum, Sec. Lt. G. R. Willis, April 25th; Lt. (actg. Capt.) F. P. Allbutt, Sec. Lt. L. J. Nobbs, Capt. C. K. Shepherd, April 26th; Sec. Lt. P. J. Beeby, Capt. T. M. Weslon, April 27th; Sec. Lt. A. B. Wearing, April 28th; Lt.-Col. H. P. Sullivan, D.S.O., April 29th; Lt. (actg. Capt.) F. W. Brookes, Lt. A. H. Brown, Capt. T. B. Morley, Maj. T. Mills, M.C., Sec. Lt. St. J. C. S. Clerke, April 30th; Capt. J. C. Ainsworth, Sec. Lt. W. F. Dick, Maj. E. A. Falconer, Capt. (actg. Maj.) R. H. Nicholson, Capt. T. V. Oddie, Lt. E. V. Pemberton, May 1st; Lt. W. H. Bokenham, Sec. Lt. (Hon. Lt.) R. Buck, Codt. (actg. Maj.) R. McPhail, May 2nd; Capt. R. W. Patterson, May 3rd; Capt. E. W. Cook, May 4th, Lt. (actg. Capt.) R. G. Cookson, May 6th; Sec. Lt. C. H. Bonnington, May 8th.

MEDICAL BRANCH.—Maj. H. Pritchard to be actg. Lt.-Col. while empld. as President, R.A.F., Invaliding Board, from Sept. 6th, 1918, to April 30th.

Transferred to unempld. list:—Capt. J. R. Stevenson, M.C., M.B. (R.A.M.C.), Feb. 25th; Capt. J. M. Wyatt, March 8th; Capt. A. G. Helsby, April 9th; Capt. R. M. Dannatt, April 26th; Capt. C. F. Graves, May 3rd.

MEMORANDA.—The following relinquish their commns. on ceasing to be empld.:—Temp. Hon. Lt. O. T. Jones, March 31st, Capt. C. W. C. Browne (Lt., R.N.), May 5th; Lt. (Hon. Capt.) F. Gay (late R.A.F.), and is permitted to retain rank of Capt., May 19th.

Transferred to unempld. list:—Lt. (actg. Capt.) G. A. Williams, from (S.O.), March 21st; Sec. Lt. G. F. Booth, March 27th; Capt. G. M. Part, from (S.O.), April 2nd; Lt.-Col. B. S. Foster, from (S.O.), April 11th; Capt. L. S. M. Pyke, from (S.O.), April 16th; Maj. (actg. Lt.-Col.) G. S. Peacock, O.B.E., from (S.O.), April 23rd; Lt. (actg. Capt.) D. Blairman, from (S.O.), April 26th; Capt. (actg. Maj.) W. S. Scott, M.C. (Lancs Fus.), from (S.O.), April 29th; Lt. (actg. Capt.) H. W. Eaton (R. Scots), from (S.O.), Capt. (actg. Lt.-Col.) W. G. Perrin, O.B.E., from (S.O.), April 30th; Capt. D. L. Abbott, from (S.O.), Capt. (actg. Maj.) L. C. Coates, Capt. (actg. Maj.) F. S. A. Baker, from (S.O.), Capt. (actg. Maj.) E. J. Briscoe, from (S.O.), Maj. (actg. Lt.-Col.) R. D. Waterhouse, from (S.O.), Maj. J. B. F. Watson, from (S.O.), May 1st; Sec. Lt. (Hon. Lt.) (actg. Lt.) J. Baillie, M.C., from (S.O.), May 6th; Capt. (actg. Lt.-Col.) W. M. Cumming, from (S.O.), May 8th.

AIR MINISTRY, May 16th.

R.A.E.—The following temp. appointments are made:—Staff Officer, 1st Cl. (P.).—Lt.-Col. (actg. Brig.-Gen.) C. L. N. Newall, C.M.G., A.M., and to relinquish the actg. rank of Brig.-Gen., April 17th.

Staff Officers, 3rd Cl. (P.).—Lt. (actg. Capt.) D. N. Stewart-Savile, M.C., and to retain the actg. rank of Capt. whilst so empld., Jan. 3rd till April 30th. (Substituted for notification in "Gazette," April 25th. (Q.) Lt. (actg. Capt.) L. V. Boxer, Feb. 1st, and to retain the actg. rank of Capt. till April 30th.

FLYING BRANCH.—Maj. S. J. Goble, D.S.O., O.B.E., D.S.C., to be actg. Lt.-Col. whilst empld. as Lt.-Col. (A.), from March 15th, to April 30th. Capt. O. A. Butcher, D.S.C., to be Capt. (K.B.) from (S.O.), April 20th; Lt. I. Morgan to be actg. Capt. whilst empld. as Capt. (K.B.), without pay and allowances of that rank, from March 20th to April 30th.

Lts. to be Lts. (A):—D. F. J. Williams, from (Ad.), Feb. 4th; H. C. G. Allen, from (S.O.), May 1st.

Sec. Lts. to be Lts.:—H. E. Fenwick, April 21st, 1918; (Hon. Lt.) W. Black, M.C., June 1st, 1918; J. W. Lissett, June 9th, 1918, W. T. Smith, Aug. 30th, 1918; H. M. Cartwright, March 6th.

Sec. Lt. (Hon. Lt.) M. F. Pencuddocke to be Sec. Lt. (O.) from (Ad.), April 23rd (and to be Hon. Lt.).

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. R. D. Brownlie, Dec. 28th, 1918 (substituted for notification in "Gazette," Dec. 13th, 1918); Lt. H. K. Thompson (Lt., C. Out. R.), Jan. 20th; Lt. J. Macklem (Lt., R. Can. Dragoons), Jan. 20th; Lt. (Hon. Capt.) A. C. Mckelvie (Suff. Yeo.), Jan. 29th; Lt. C. E. French (Lt., E. Ont. R.), Feb. 16th; Lt. (Hon. Capt.) P. R. White (Capt., E. Ont. R.), Feb. 18th; Lt. C. MacLaughlin (Lt., Can. F. Art.), Feb. 20th; Sec. Lt. G. C. Easton (Capt., Manitoba R.), Feb. 28th; Lt. (actg. Capt.) M. W. Richardson (Capt., C. Ont. R.), March 10th; Lt. A. St. J. Highstone (Lt., E. Ont. R.), March 17th; Lt. A. Goby (Lt., Sask. R.), March 18th; Sec. Lt. (Hon. Lt.) M. E. Patterson (Lt., Alb. R.), March 21st; Lt. G. B. Dixon, M.M. (Lt., Cent. Ont. R.), Lt. R. R. Haley (Lt., Nova Scotia R.), March 31st; Sec. Lt. A. C. Taylor (C. Ont R.), April 11th, Maj. G. C. O. Usborne (Maj., Can. M.G.C.), April 19th; Lt.-Col. G. C. St. P. du Bombasle (Capt., Nova Scotia R.), April 18th; Lt. S. Guillon (Lt., Sask. R.), April 21st; Maj. O. C. Macpherson (Maj., Can. Engrs.), April 23rd; Lt. G. Thornley (Sec. Lt., Lancs. Fus.), April 30th.

The following are transferred to unempld. list:—Lt. A. E. West-Oram, Jan. 24th; Sec. Lt. S. A. Slater, Feb. 8th; Lt. T. Ulster, Feb. 11th; Sec. Lt. T. Nolan, Feb. 23rd; Lt. A. A. Buckley, Lt. R. J. Marshall, Feb. 28th; Sec. Lt. (Hon. Lt.) K. G. H. R. Gunn, Sec. Lt. W. Partridge, March 2nd; Lt. H. S. Selvis, Capt. J. Sec. Lt. A. Imms, March 5th; Capt. Lt. F. C. Plowden, March 18th; Lt. A. A. Mitchell, March 26th; Sec. Lt. S. A. Gulliver, Sec. Lt. J. V. Poulson, April 1st; Sec. Lt. G. F. Bassett, Sec. Lt. (Hon. Lt.) R. H. Hampton, April 2nd; Lt. (Hon. Capt.) E. C. F. Ferreira, April 6th; Lt. J. C. Houston, April 8th, Lt. (Hon. Capt.) S. H. Holland, Sec. Lt. F. A. Parker, April 9th; Lt. J. M. A. Ewer, Maj. D. G. Ross-Hume, Lt. A. V. Gallie, Lt. A. R. Gibson, Capt. Lt. C. E. Pullen, Sec. Lt. T. V. Preedy, April 11th; Sec. Lt. F. W. Ford, April 12th; Lt. S. J. Hine, Capt. G. A. Lascelles, Sec. Lt. D. I. Plumpton, Sec. Lt. A. K. Robinson, April 13th; Sec. Lt. F. S. E. Hall, Sec. Lt. A. Woodward, April 15th, Sec. Lt. G. B. Eldred, Sec. Lt. S. G. Fidoe, Sec. Lt. J. O'Flaherty, April 16th; Lt. E. M. Ackery, Sec. Lt. L. B. Farmiloe, Sec. Lt. (Hon. Lt.) D. E. Price, Sec. Lt. (Hon. Lt.) A. M. Pawsey, April 17th; Sec. Lt. R. W. F. Dunning, April 18th; Sec. Lt. A. O. Goldthorpe, Sec. Lt. F. H. Lyon-Hall, Sec. Lt. J. D. MacIntyre, Sec. Lt. W. H. Phethean, April 19th; Sec. Lt. R. W. F. C. Frost, Sec. Lt. F. C. Hird, Sec. Lt. R. T. O. Hawthorne, Sec. Lt. W. E. B. Lyon, Lt. J. R. Watson, April 21st; Lt. N. N. C. Runciman-Ross, April 22nd; Lt. J. J. Anstey, Sec. Lt. W. L. Dixon, Sec. Lt. G. D. Pomphrey (Lt., actg. Capt.) A. E. Hedges, April 23rd; Sec. Lt. (Hon. Lt.) R. Girvan (Cameronians), Sec. Lt. J. Harston, Sec. Lt. T. M. MacIntyre, Sec. Lt. B. F. Ross, Lt. C. W. Thomas (B. Col. R.), Lt. A. W. Wood, April 24th; Sec. Lt. R. W. A. Bridgen, Sec. Lt. H. E. Givan, Lt. L. N. Graham, Lt. R. O. Overbury, Sec. Lt. R. H. Young, April 25th; Sec. Lt. (Hon. Lt.) S. Fleming, Lt. J. H. Baring-Gould, Sec. Lt. M. W. Gallon (R.F.A.), Lt. B. Norcross, Sec. Lt. H. St. Clair, Lt. E. F. Terry, Sec. Lt. C. G. J. Whiteside, April 26th; Lt. A. V. Goble, April 27th; Lt. L. A. Colley, Sec. Lt. H. Ellis, Sec. Lt. F. A. Wilson, April 28th; Sec. Lt. L. C. Belcher, Sec. Lt. G. E. Ellams, Sec. Lt. H. J. Gambling, Sec. Lt. R. Latham, Sec. Lt. A. F. Bell, Sec. Lt. F. B. Robinson, Sec. Lt. T. J. Wilson, April 29th; Sec. Lt. S. E. Alexander, Capt. (actg. Maj.) T. J. Brampton, Lt. W. D. Clark, Sec. Lt. E. D. Evans, Lt. R. F. Freeland, Sec. Lt. T. H. H. Fuge, Sec. Lt. (actg. Capt.) O. Gibb, Lt. (actg. Capt.) H. Hercock, April 30th; Sec. Lt. W. H. S. Gee, Sec. Lt. R. M. Miller, Sec. Lt. J. B. Mackie, Sec. Lt. L. J. Mellin, Lt. G. C. Pilgrim, Lt. (Hon. Capt.) C. K. Robinson, Lt. T. Shepard, Sec. Lt. C. Wingate, Lt. S. A. Williams, May 1st; Lt. J. A. Atkins, Lt. F. W. Bristow, Sec. Lt. M. Bennie, Sec. Lt. F. P. Chaplin, Lt. A. C. Edgley, Lt. S. W. Mountain, Capt. (actg. Maj.) W. E. G. Murray, Sec. Lt. W. Robinson, Lt. O. Williams, May 2nd; Sec. Lt. R. B. Gotch, Sec. Lt. W. S. McDonough, Sec. Lt. (Hon. Lt.) A. MacAskill, Sec. Lt. W. J. Ramsbottom, Sec. Lt. N. F. Wood, Capt. G. Mackrell, May 3rd; Lt. (actg. Capt.) F. H. Dunham, May 4th; Sec. Lt. N. S. Calder, Sec. Lt. W. M. Newton, May 5th; Sec. Lt. G. H. Greenwood, Lt. E. H. S. Morris, Lt. A. I. Meacham, Lt. O. L. Owen, May 6th; Lt. A. F. Ferguson, May 7th; Sec. Lt. B. T. Cato, Lt. R. N. Hayden, Sec. Lt. W. E. Hampel, Sec. Lt. H. E. Hieatt, Sec. Lt. A. P. Mawson, Sec. Lt. R. L. McGowan, Sec. Lt. C. A. McIntosh, Sec. Lt. A. E. McNicoll, Sec. Lt. G. T. Young, May 8th; Lt. J. L. Drummond, May 8th.

Capt. D. F. Ellis relinquishes his commn. on account of ill-health and is permitted to retain his rank, May 2nd.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—A. D. G. Drummond (contracted on active service), R. W. Duff, contracted on active service), April 20th; A. Hartley, A. Impey, May 6th; Lt. (actg. Capt.) W. E. Holland, Scott. Horse Yeo., relinquishes his commn. on account of ill-health, May 5th.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—A. Nicholson, April 24th (substituted for notification in "Gazette," Feb. 14th); W. T. Leonard (contracted on active service), May 1st; S. M. Myles (contracted on active service), May 3rd; W. A. Rann, May 8th; Sec. Lt. S. E. Calvert resigns his commn., May 17th; Sec. Lt. G. B. Noble is antedated in his appointment as Sec. Lt. (A), Aug. 24th, 1918.

The surname of Sec. Lt. F. Wight is as now described, and not Wright as stated in "Gazette," April 1st.

The notification in "Gazette," Feb. 4th, concerning Lt. W. C. Marsh is cancelled.

The notification of March 25th concerning Sec. Lt. H. B. Hewat is cancelled.

The notification of April 4th concerning Lt. W. H. Gibson is cancelled.

ADMINISTRATIVE BRANCH.—Majs. to be Majs. from (S.O.):—J. St. A. King, E. F. Hutchinson, May 1st; Capts. to be Capts., from (S.O.):—E. Cameron, R. D. Hallam, April 1st; W. M. Cumming, May 1st; R. L. Allport, May 6th; Capt. E. P. Hardman, D.F.C., is confirmed in his rank of Capt., May 5th.

Lts. to be graded for purposes of pay and allowances as Capts.:—H. J. W. Fletcher (Hon. Capt.), E. V. Tarrant, May 1st.

Lts. to be actg. Capts. whilst empld. as Capts.:—H. J. W. Fletcher, from Jan. 4th to April 30th; (Hon. Capt.) E. V. Tarrant, from Jan. 27th to April 30th.

Sec. Lt. (Hon. Capt.) (actg. Capt.) E. Codyre to be Lt. and to retain his hon. rank, July 21st, 1918.

Lts. (actg. Capts.) to be Lts., from (F.), and relinquish their actg. rank of Capt. on ceasing to be empld. as Capts.:—M. R. Helliwell, April 17th; V. Wigg, April 28th

Lts. (A.) to be Lts.:—T. A. Akin, H. R. Caffyn, C.—W. L. Calvert, F. W. C. Davies, C. J. Fletcher, G. S. Lee, B. FitzW. Levett, A. W. Symington, M.C., P. W. Smith, L. G. Taylor, N. J. Taylor, (April 17th; Lt. L. C. Beaver to be Lt., from (A. and S.), April 17th

Lts. (O.) to be Lts.:—J. R. Currington, E. R. V. Catlett, W. E. McLean, M.C., April 17th; Lt. L. A. Rees to be Lt., from (S.), April 1st.

Lts. to be Lts., from (S.O.).:—D. Blairman, F. A. Corbett, Sec. Lt. A. H. Petch to be Sec. Lt., from (A.), April 17th

Sec. Lts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lts.:—A. Tulloch, Sept. 2nd, 1918; F. J. Deane, Nov. 16th, 1918.

The following relinquish their commns. on ceasing to be empld.:—Lt. (Hon. Capt.) (actg. Capt.) W. S. Ford (E. Surr R.), Dec. 4th, 1918; Capt. S. Morris (R.A.S.C.), March 4th; Capt. (actg. Maj.) G. H. C. the Earl of Rocksavage (Capt., 9th Lrs.), April 12th

The following are transferred to unempld. list:—Sec. Lt. (actg. Lt.) E. S. De Pass, Feb. 16th; Sec. Lt. F. C. B. Phillips, Feb. 17th; Sec. Lt. (actg. Capt.) L. Coombes (Northants R., T.F.), March 6th; Lt. F. W. Higgins, April 10th; Sec. Lt. R. E. Pull, April 14th; Lt. G. McMullen, Sec. Lt. J. H. Parry, April 26th; Sec. Lt. W. F. McManus, April 29th; Lt. (Hon. Capt.) H. M. Eldridge, M.C., Lt. A. Fowler, April 30th; Sec. Lt. W. D. Barnett, Sec. Lt. S. H. Wood, May 1st; Sec. Lt. (actg. Lt.) W. Warwick, May 2nd; Lt. T. J. Gillew, May 4th; Sec. Lt. J. A. Weatherley, May 5th.

Sec. Lt. J. G. Elliott relinquishes his commn. on account of ill-health, and is permitted to retain his rank, May 9th.

Sec. Lt. G. A. Beith is removed the Service, his Majesty having no further occasion for his services as an officer, Feb. 14th. The unit of Lt. H. Townsend (Durh. L.I.) is as now described, and not High. L.I. as stated in "Gazette," Nov. 1st, 1918.

The notification in "Gazette," Feb. 28th, concerning Lt. M. Helliwell is cancelled.

The notification in "Gazette," May 9th, concerning C. A. Henshaw is cancelled.

TECHNICAL BRANCH.—Maj. H. J. Newton-Clare, O.B.E., to be Maj., Grade (B), from (S.O.), May 1st.

Lt. J. A. Atkinson to be actg. Capt. while empld. as Capt., Grade (A.), June 1st, 1918 (substituted for notification concerning this officer which appeared in "Gazette," Feb. 14th).

Sec. Lts. (actg. Capts.) to be Lts., without pay and allowances of that rank, and to retain their actg. rank until April 30th:—J. M. McEntegart, Jan. 19th; J. R. Coulthard, April 23rd; Sec. Lt. J. Tunbridge to be Sec. Lt., Grade (B), from (AD), Jan. 4th.

Sec. Lt. W. E. Hunt (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt., Grade (B), April 20th

The following are transferred to unempld. list:—Sec. Lt. G. C. Figot, March 6th; Sec. Lt. C. W. Pidcock, March 8th; Lt. G. M. Denman, March 13th; Sec. Lt. W. H. Saunders, April 10th; Lt. (actg. Maj.) G. L. Chater (Norf. R.), Sec. Lt. F. Child, Lt. A. E. Lowry, April 14th; Sec. Lt. L. W. St. Hill-George, April 16th; Capt. G. G. Mannings, April 16th; Sec. Lt. E. Gough, April 17th; Capt. L. R. Prichard, April 22nd; Lt. L. J. E. Genner, April 23rd; Sec. Lt. (Hon. Lt.) (acts. Capt.) P. M. George, Maj. A. F. Palmer, Capt. H. E. Powell, April 25th; Capt. (actg. Maj.) G. L. Paine, April 26th; Lt. (actg. Capt.) A. Armstrong, April 30th; Sec. Lt. F. G. Buck, Lt. W. J. Harris, Sec. Lt. C. Urmson, Sec. Lt. H. J. Watkin, Sec. Lt. R. L. Wills, May 1st; Sec. Lt. (actg. Lt.) K. Gray, Lt. J. D. Richards, May 2nd; Lt. F. J. R. Perfitt, Lt. (actg. Capt.) C. M. Pletts, May 4th; Capt. C. B. Tidmarsh, May 6th; Lt. (actg. Capt.) A. W. Pine, May 7th; Lt. H. C. Perks, May 8th; Lt. J. W. McKee, May 10th; Maj. L. Y. K. Murray resigns his commn. and is permitted to retain his rank, May 17th

The following relinquish their commns. on account of ill-health contracted on active service:—Lt. L. N. Page, May 6th, and is permitted to retain his rank; Lt. A. Dobner, May 7th; Sec. Lt. E. I. Davies, April 29th, and is permitted to retain his rank

Notification of Feb. 25th concerning Maj. H. F. Fisher is cancelled.

MEDICAL BRANCH.—The following relinquish their commns. on ceasing to be empld.:—Hon. Lt.-Col. G. Dreyer, March 31st, and is permitted to retain the rank of Lt.-Col.; Maj. (actg. Lt.-Col.) R. H. McGiffen (Staff Surgeon, R.N.), Jan. 13th

The following are transferred to the unempld. list:—Maj. P. H. Hadfield, April 1st; Capt. J. J. O'Mullane, April 24th; Maj. A. Paling relinquishes his commn. on account of ill-health, and is permitted to retain his rank, May 5th.

The notification of May 13th concerning Capt. C. F. Graves is cancelled.

CHAPLAINS BRANCH.—Capt. H. E. Horton is transferred to unempld. list, April 16th.

MEMORANDA.—Capt. A. F. Morris (Welsh R.) is granted the hon. rank of Maj., May 16th.

The following relinquish their commns. on ceasing to be empld.:—Temp. Hon. Lt. H. C. Smith, March 16th; Temp. Hon. Capt. M. Windsor, May 16th.

The following are transferred to unempld. list:—Capt. C. J. Foot, from (S.O.), Jan. 22nd; Capt. (actg. Maj.) P. N. Logan, O.B.E., from (S.O.), April 16th; Capt. (actg. Maj.) H. Eyes, from (S.O.), April 24th; Sec. Lt. (Hon. Lt.) (actg. Maj.) P. M. Greenwood (D.L.I.), from (S.O.), April 27th; Lt. (actg. Capt.) F. C. E. Dimmick, from (S.O.); Capt. (actg. Maj.) G. G. Fairbairn (Gloster Yeo.), from (S.O.), May 1st; Maj. (actg. Lt.-Col.) A. J. Clark (Lond. R.), from (S.O.), May 2nd.

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, May 15th.

The King held an Investiture in the Quadrangle of the Palace at 11 o'clock.

The following were severally introduced into the presence of the King, when his Majesty invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:—

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE.—COMMANDER (Military Division):—Col. Ralph Stoney, R.A.F.

THE DISTINGUISHED SERVICE ORDER.—Maj. Arthur Jacob, R.A.F.

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE.—OFFICER (Military Division):—Maj. the Hon. Maurice Baring, R.A.F.

His Majesty then conferred decorations as follows:—

THE MILITARY CROSS.—Capt. Hugh Lloyd, R.A.F.; Lt. Arthur Purbury, York Reg., attd. R.A.F.; Lt. Richard Carles, Bedford Reg., attd. R.A.F.; Lt. Ewart Stock, R.A.F.

BUCKINGHAM PALACE, May 17th

The following officers were severally introduced into the presence of the King, when his Majesty invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:—

THE MOST DISTINGUISHED ORDER OF SAINT MICHAEL AND SAINT GEORGE.—Companion.—Col. Harold Briggs, R.A.F.

THE DISTINGUISHED SERVICE ORDER.—Lt.-Col. Jack Cunningham, R.A.F.; Maj. Allister Miller, R.A.F.; and Lt. Robert Lovemore, R.A.F.

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE (MILITARY DIVISION).—Officer.—Maj. Philip Logan, R.A.F.

His Majesty then conferred decorations as follows:—

THE MILITARY CROSS.—Capt. Beauchamp Boultbee, Gen. List, attd. R.A.F.; Capt. Brian Swift, R.A.M.C., attd. R.A.F.; Lt. Alfred Jones, R.G.A., attd. R.A.F.

ADMIRALTY APPOINTMENTS.

The following appointment has been made:—

MAY 19th.—Bosn.—T. Vale to "Furious," May 17th.

OFFICIAL COMMUNIQUES.

The India Office issued the following communiqués received from the Government of India on May 14th:—

MAY 12th.—Operations on May 11th included air reconnaissances in Ezzar to Beseewal and Kam Dakka. Bombing raids were carried out with effect.

Estimate enemy killed on 11th at least 100, including many Afghan regulars.

MAY 14th.—Dakka still reported evacuated as result of our air raids, and no movements of importance observed on Jalalabad road.

THE CASUALTY LIST.

AIR FORCE.

Reported May 19th

ACCIDENTALLY KILLED.—Adkins, Capt. R., R.A.F.
Batchelor, Maj. T. A., R.A.F.
Ritchie, Capt. S. E., R.A.F.
Tolley, Lt. C. R., R.A.F.
Whiteside, Lt. A. B., R.A.F.

DIED OF INJURIES.—Baillie, Lt. W., R.A.F.
O'Reilly, Lt. N., R.A.F.

REPATRIATED.—Barker, Capt. E. R., R.A.F.; Bardgett, Lt. W. E., R.A.F.

PERSONAL NOTICES.

NAVAL.

DEATH.

HARRISON.—Major James Ingleby Harrison, R.A.F. (Lieut.-Commander, R.N.), who was previously reported missing, is now officially presumed to have been killed in action over Bruges on May 16th, 1918. He was the fourth son of the late Rev. J. J. Harrison (Chaplain, R.N.), and Mrs. Harrison, Boscastle, Cornwall, and was 36 years of age.

MILITARY.

DEATHS.

BRITTOROUS.—Sec. Lieutenant Oswald George Brittorous, R.A.F., late S. W. Borderers and Civil Service, was reported missing after a squadron engagement east of Villiers-Bretonneux on May 15th, 1918, and is now presumed dead. Information subsequent to above date would be gratefully received by his parents at "Glenlyon," Rochdale Road, Blackley, Manchester. He was 19½ years of age.

JAMES.—Capt. Alyn Reginald James, Denbighshire Yeomanry, attd. R.F.C., who was previously reported missing, is now reported to have been killed on March 24th, 1918, near Amiens, while leading his flight. He was the second son of Mr. and Mrs. Percy James, Kilhendre, Gresford, North Wales, and was 23 years of age.

WARMAN.—Capt. Clive Wilson Warman, D.S.O., M.C., D.F.C., R.A.F., died on May 12th at the Edmonton Military Hospital, from injuries received in the aeroplane accident which occurred on May 8th when he and Lieut. Macpherson, R.A.F., were flying over the Edmonton Sewage Farm. The machine was seen to descend rapidly, and the two officers were buried beneath the wreckage. They were taken to the Edmonton Hospital, where they were found to be suffering from severe concussion.

An inquest was held at Edmonton Military Hospital on May 13th on the body of Capt. Warman.

On May 8th, Capt. Warman, as pilot, and Lieut. Macpherson, R.A.F., went for a flight from the Chingford Aerodrome. They had been doing a number of stunts and were attempting another when they appeared to nose-dive too close to the ground, with the result that machine struck a gate and turned over. Both Capt. Warman and Mr. Macpherson were taken to hospital suffering from severe concussion of the brain. Capt. Warman did not recover consciousness, and died on May 13th.

An officer from the aerodrome said he flew the same machine for 40 minutes on the previous day, and it was in perfect condition. Four persons who were sitting on the gate at the time of the accident were injured.

A verdict of "Accidental death" was returned.

BIRTHS.

COCHRANE.—On May 12th, at 12, Claremont Terrace, Glasgow, W., to Margarita MacIlvride, wife of Major J. A. Cochrane, M.C., R.A.F.—a son.

DENNIS.—On May 7th at Southsea, to Lydia (née Gorman),

the wife of Lieut. C. Noël Dennis, late R.F.C. and R.A.F.—a son.

SPRATT.—On May 7th, at 13, Prince's Gate, S.W.7, the wife of Capt. N. C. Spratt, R.A.F. (late R.F.C.), of a daughter.

AIR FORCE.

DEATHS.

DAVIS.—Sec. Lieut. Cecil Sealey Davis, R.A.F., who died on May 7th, at Crail, Fife, was the son of Mr. G. W. Davis, J.P., and Mrs. Davis, of Ilford, Essex. He was 19 years of age.

NORTON.—Mr. Ingleby Oddie, the Westminster coroner, held an inquiry on May 13th into the death of Lieut. George Norton, R.A.F., aged 21, a native of Lisbon, who died in the Empire Hospital for Officers, Vincent Square, S.W.

Capt. J. E. Simpson, R.A.F., said that on Oct. 30th, 1918, Mr. Norton was running into the aerodrome at New Romney, Kent, on a Bristol fighter (Rolls-Royce engine), with an observer. It was not a new biplane, but it had been examined the same day and found to be correct. Mr. Norton was coming in from a flight and, seeing a large number of people in the aerodrome who might have been less experienced than he was, and not wishing to frighten them, he came down very slowly and flat. He tried to restart his engine, but it did not respond, and the machine hit a bank and overturned into a ditch.

Mr. Norton fractured his spine, but the observer was not seriously hurt. He was in hospital in Shoreliffe till Dec. 6th, when he was transferred to London He was quite an experienced pilot, and had flown hundreds of miles. He had done 297 hours on this particular type of machine, besides others. There was nothing faulty with the machine; it was an error of judgment.

Capt. Charles Riddoch, R.A.M.C., said that Mr. Norton died on May 10th from the effects of a fracture of the spine.

The coroner recorded a verdict of "Accidental death through a fall from an aeroplane."

Lieut George Norton, R.A.F., was the second son of J. F. Norton, of Lisbon.

SALMON AND HARWOOD.—At an inquest on May 3rd it was stated that Lieut. Harwood, R.A.F., whose death was announced recently, had just taken one of the latest types of machine from London, and was making a short flight from Ford aerodrome with Lieut. Frederick Salmon, R.A.F., and Lieut. De Gersigney, R.A.F., as passengers. The machine had scarcely left the ground when the spectators noticed that it was not climbing as well as it should have done, the pilot evidently having trouble with the starboard engine. When the machine had nearly completed a semi-circle of the aerodrome, it suddenly went into a left-hand spin, and crashed to the earth from a height of nearly 100 feet. Both deceased officers had served in France, and they were experienced pilots. The accident was attributed to trouble with one engine, which had probably given out altogether, with the result that the other engine forced the machine into a fatal spin to the earth. Accidentally killed whilst flying was the coroner's verdict.

Lieut. Gerald Harwood, R.A.F., was the only son of Horace G. and Hilda Harwood, of "The Rookery," Chislehurst. He was 24 years of age.

SMITH.—Hugh Cassillis Smith, 78th Squadron, R.A.F., who was killed on May 15th while flying near Hornchurch Aerodrome, was the second son of Mr. and Mrs. Macdonald Smith, 41, Onslow Gardens, Muswell Hill. He was 19 years of age.

ENGAGEMENT.

ADAMS—ARBUTHNOTT.—The marriage arranged between Lieut.-Colonel W. Boys Adams, R.A.F., and Miss Enid Carnegy Arbuthnott will take place on Wednesday, July 2nd, at St. Paul's, Knightsbridge.

MARRIAGES.

FIRTH—HODGSON.—On April 29th, at Winchester Cathedral, John Charles Bradley Firth, late Major R.A.F., younger son of Mr. and Mrs. Bradley Firth, of Bishop's Sutton, Hants, was married to Ruth Eleanor, younger daughter of the Rev. J. H. Hodgson, of Dogmersfield Rectory, Hants, by the Rev. R. T. Marshall.

FAULKNER—REGAT. — On May 14th, 1919, at the Church of Our Lady, St. John's Wood, London, Harold Edward, late Lieut. R.A.F., younger son of Charles Robert Nicoll Faulkner, was married to Elsie Marie Josephine, third daughter of Joseph Henri Régat, of Brussels, by the Very Reverend Canon Brennan.

BIRTHS.

SQUIRE.—On May 11th, at Firbank, Hythe, to Dorothy, (née Walter), wife of Lieut. H. F. Squire, R.A.F., M.S., a son.

WILSON.—On May 15th, at Horsley Priory, Nailsworth, Gloucestershire, the wife of Major J. P. Wilson, I.C.S., A.F.C. (late R.A.F.), of a son.

ATHLETICS IN THE R.A.F.

The Imperial Services' Boxing Championships were concluded at the Northampton Institute on May 15th.

There was a better attendance than on the previous day, but it was still disappointing. H.R.H. the Prince of Wales, K.G., in the uniform of the Royal Scots Fusiliers, of which he is Honorary Colonel, watched the final bouts in the evening and presented the prizes to the winners.

RESULTS.

Officers' Fly-weights.—Final Bout.—Lieut. S. Wilson (Army) beat Capt. H. G. R. Malet (R.A.F.), on points.

Officers' Feather-weights.—Final Bout.—Sec. Lieut. C. E. Hodgkinson (R.A.F.) beat Lieut. M. Nathan (Army) on points.

Officers' Light-weights.—Final Bout.—Capt. F. W. Smith (R.A.F.) beat Lieut. Reynolds (R.N.) on points.

Officers' Welter-weights.—Final Bout.—Lieut. W. W. Shoales (Army) beat Lieut. S. J. Mason (R.A.F.) on points.

Officers' Middle-weights.—Final Bout.—Lieut. L. H. Bayley (R.N.) beat Sec Lieut. K. P. McIntee (R.A.F.) on points.

Officers' Light-heavy-weights.—Final Bout.—Lieut. Hunaran (R.N.) beat Capt. T. Roberts (R.A.F.) on points.

OTHER RANKS.

Fly-weights.—Final Bout.—Pte. R. Sellers (A.I.F.) beat Serjt. Groves (R.A.F.) on points.

Welter-weights. — Final Bout. — Serjt. Swinnerton ("Jim Frendy") (R.A.F.) beat Pte. Fred Housego (Army) on points.

Middle-weights.—Final Bout.—Seaman Larby (R.N.) be Cpl. Garrett (R.A.F.) on points.

The final tie in the Bulldog Challenge Cup competition attracted 10,000 spectators to the Fulham F.C. ground on Saturday, May 17th. They saw plenty of goals scored, but these were not distributed according to anticipation, as the Scots brought off a big surprise by winning the trophy by 5 goals to 2.

The R.A.F. had a powerful side out, its front rank consisting exclusively of first-class players, among them being Morris (the West Bromwich and Fulham centre), Bliss (Tottenham Hotspur), and Pick (Brentford), while in the half-back line there were three well-known League players in Bell, Cannon, and Beckerleg.

A Royal Air Force crew will compete for the King's Cup at Henley Regatta. This race is open only to crews of amateur oarsmen who have served in the Navy, Army, or Air Force of any country that fought for the Allied cause.

PERMANENT COMMISSIONS.

The following letter has been received:—

Sir,—With reference to your article in THE AEROPLANE, I beg to say that I was educated at a public school and applied for a permanent commission in the R.A.F., but was graded "C" (or 3 as per your article).

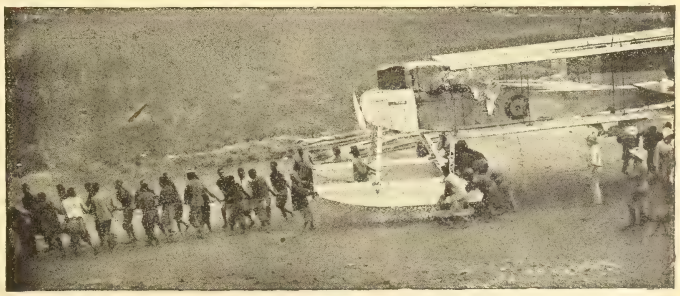
It would appear, therefore, that a public school education only entitles one to be placed in grade B (or 2) if one is *not* a proved fighting pilot (or is it if one is *not* an ex-R.N.A.S. pilot?)

If one happens to be an ex-R.N.A.S. pilot with considerable service, a good fighting record, a public school education, and to have joined young, the answer to an application for a permanent commission is to be demobilised with the contempt one deserves—at least, this is the experience of

R.N.A.S. Pilot.

FLYING TO EGYPT.

A British aeroplane with a crew of four Air Force aviators landed on May 18th at the Californie aviation ground at Nice. The machine came from Lille, and is on its way to Egypt.



A Short Seaplane (225 h.p. Sunbeam Engine) in Central Africa with the R.N.A.S.

THE ROYAL AERO CLUB.

Entrance Fee and Subscription for New Members.

In accordance with the resolution passed unanimously at the annual general meeting of the Royal Aero Club, on March 31st, 1919, the subscription for members elected on or after May 31st, 1919, will be £7 7s. per annum, and the entrance fee, £5 5s.

The Flight to Australia.

A meeting of the Technical Committee was held on Monday, May 5th, 1919, when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the Chair, Mr. Griffith Brewer, Lieut.-Col. D. Harries, Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F., Major R. H. Mayo, Lieut.-Col. Alec Ogilvie, and Mr. Howard T. Wright. In attendance: Lieut.-Col. Towler and Major Bernard, of the Air Ministry, and Mr. H. Fulton, Mr. A. R. Fenn, and Mr. C. V. Allen, of the Society of British Aircraft Constructors. Mr. Harold E. Perrin, Secretary.

The Committee considered the regulations governing the prize of £10,000 offered by the Australian Government for a flight from Great Britain to Australia.

The Flying Services Fund.

H.R.H. the Prince Albert, K.G., has been pleased to accept the Chairmanship of the Flying Services Fund.

At the present time nearly 200 widows and dependents of airmen are receiving benefits from the Fund, and the education of over 150 children is being undertaken.

A meeting of the Flying Services Fund Committee was held on Wednesday, May 7th, 1919, when there were present:—Brig.-Gen. R. H. More, C.M.G., in the Chair; Mr. Chester Fox and Mr. B. Stevenson, Assistant Secretary.

Grants and Allowances.

The following grants and allowances were made:—

(92) A continued allowance of £2 a month for six months to the widow of a 2nd Class Air Mechanic in the Royal Flying Corps who had been killed on active service.

(103) A continued allowance of £1 10s. a month for six months to the widow of a 2nd Class Air Mechanic in the Royal Flying Corps who had been killed on active service.

(194) An allowance of £2 a month for six months to the mother of a 2nd Class Air Mechanic in the Royal Air Force who had died on active service.

(196) An allowance of £1 a month for six months to the mother of a Private in the Royal Air Force who had died on active service.

(198) An allowance of £4 a month for six months to the widow of a Captain in the Royal Air Force who had been killed on active service.

A Committee Meeting.

A special meeting of the Committee was held on Tuesday, May 13th, 1919, when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the Chair; Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Lieut.-Col. J. Dunville, R.A.F., Lieut.-Col. F. K. McClean, Brig.-Gen. E. M. Maitland, D.S.O., Lieut.-Col. Alec Ogilvie, and Mr. H. E. Perrin (Secretary).

Election of Members.

The following new members were elected:—

Major George Henry Abell, R.A.F.
Lieut. Ernest Allingham, R.A.F.
Capt. Joseph Dover Atkinson, R.A.F.
Philip Conway.
Major Cecil Hill Darley, R.A.F.
Cyril Joseph Feeny.
Capt. Gerald William Gathergood, R.A.F.
David Gill.
Capt. Lacy Norman Glaisby, R.A.F.
John Leonard Greener.
Capt. William Ernest Bertram Holland (Scottish Horse).
Norman Robert Melville.
Flight Lieut. Karel Muller (Royal Dutch Naval Air Service).
Capt. Sydney James Read, R.A.F.
Capt. John Guy Russell, R.A.S.C.
Charles Louis Scott.
Major George Herbert Scott, R.A.F.
Lieut. Cuthbert Henry Dolling Smith, R.A.F.
Capt. Fred Wilkinson (South Staffordshire Regt.)

The Rolls Memorial Library.

The following Committee was appointed to go into the question of purchasing books for the Club:—

Mr. C. G. Grey.
Major C. C. Turner.
Mr. Howard T. Wright.

World's Aeronautical Records.

A meeting of the Technical Committee was held on Tuesday, May 13th, 1919, when there were present:—Lieut.-Col. F. K. McClean, in the Chair; Mr. Griffith Brewer, Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Major R. H. Mayo, Lieut.-Col. Mervyn O'Gorman, C.B., Lieut.-Col. Alec Ogilvie, Lieut.-Col. H. T. Tizard, Mr. Howard T. Wright, and Mr. Harold E. Perrin, Secretary.

The Committee fully discussed the question of World's Aeronautical Records with particular reference to the British performances put up during the war.

The regulations governing records recognised by the Fédération Aéronautique Internationale were also considered, and it was decided to put forward various suggestions for the alteration of these regulations at the Conference of the Fédération Aéronautique Internationale to be held in Paris on the 19th inst., at which the Club will be represented by:—

Lieut.-Col. F. K. McClean.
Lieut.-Col. Alec Ogilvie.
Lieut.-Col. Mervyn O'Gorman, C.B.
Mr. Harold E. Perrin (Secretary).

MORE GRIEVANCES OF CADETS.

The following letter has been received:—

Sir,—I have noticed in a recent issue of The Aeroplane a "grouse" from an overseas cadet. As a British cadet who was sent overseas may I trespass on your valuable space?

In January, 1918, having passed my cadet wing in England, I volunteered to complete my training in Egypt. I embarked with a draft of forty-nine other misguided youths on January 28th, landed in Egypt on February 13th, and after a wait of three weeks (March 6th) went to a S.M.A.

In spite of assurances, and in one case at least, a definite promise from those in authority, commissions never had been granted after S. of A. in Egypt. It was necessary to do two hours' solo flying. This rose to twenty hours with the Air Force Act, and as the climate did not suit me I was only able to complete about ten hours, with the result that I was demobilised as an F. Cadet.

Those who were wise enough not to come with us are now all full lieutenants or captains, and at least one is a major.

None of us were commissioned before the end of June, and in the meantime we received no tropical kit allowance and no issue of drill clothing or boots. Oh, to be a cadet on 10s. 6d. a week! I have only drawn the £9 granted by the cadet wing, and I have spent at least £70 during the time I have been a cadet, and because my tent was burnt down and all receipts with it, and I refitted myself from a native tailor who had never seen a receipt in his life, I shall probably receive nothing of the recently much advertised kit allowance.

On leaving the Cadet wing our places were taken by a crowd of civilians. Four months later some of them were *teaching* some of my draft to become observers! All our applications for ante-dating of commissions were approved by Middle East and rejected by Air Ministry.

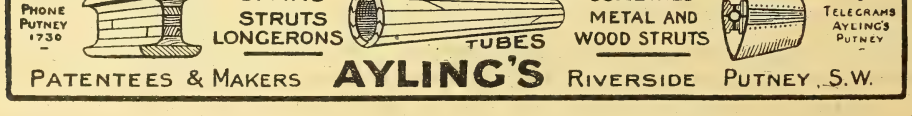
Through being over keen on flying and through false assurances, I personally have lost £300-£400, in addition to loss of position and prestige.

Is it any wonder that I and my friends are fed up with the (hot) Air Force?

1917 Cadet.

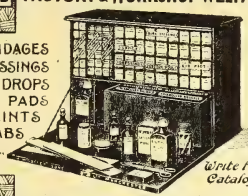
STUNTING OVER RACECOURSES.

French aviators have been officially warned that they must no longer "stunt" over racecourses. Stunting has been one of the attractions at all recent meetings.—[To whom?—Ed.]



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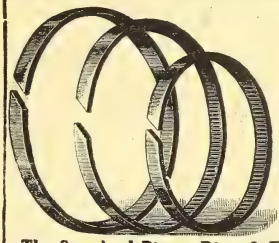


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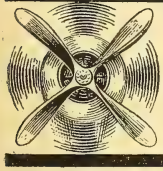
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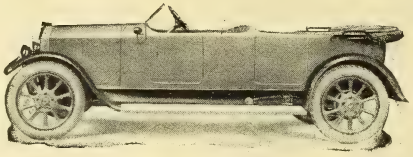
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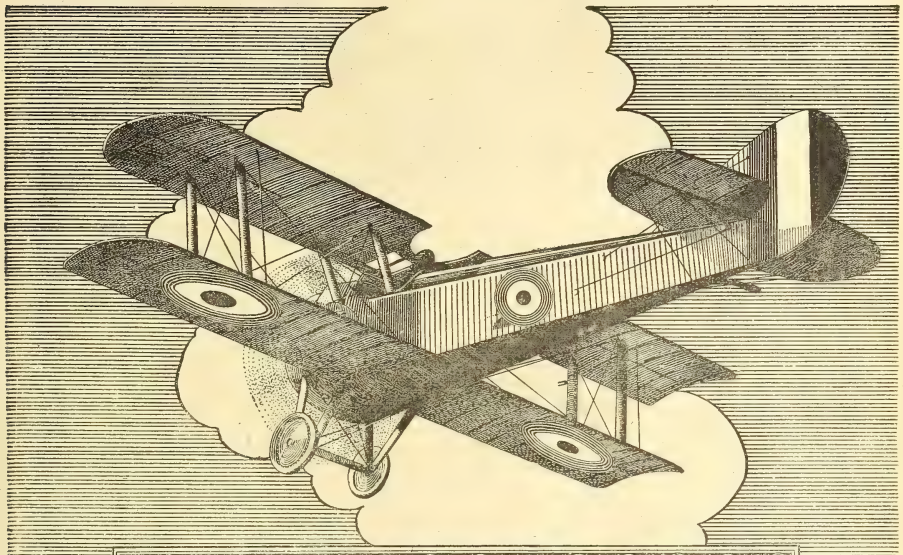
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ON THE REGULATION OF CIVIL AVIATION IN THE BRITISH ISLES.

(PART IV.)

Schedule V of the Regulations deals with Log Books very briefly, as follows:—

SCHEDULE V.

Log Books.

1. Log books shall take the form of an aircraft log book, an engine log book, a journey log book, and a signal log book. If more than one engine is fitted a separate log book shall be provided for each engine.

2. Each log book shall be self-contained, but all log books shall be kept together in the aircraft in a waterproof bag of a pattern authorised by the Secretary of State.

3. The log books shall conform in all essentials to the patterns authorised by the Secretary of State, and shall contain such information and particulars as the Secretary of State may direct.

The Directions are but little longer, and read thusly:—

V.—INSTRUCTIONS FOR USE OF LOG BOOKS.

1. With reference to Regulation 2 (3) and Schedule V, the several log books should contain the information shown below.

2. The constructor should fill in and sign the original entries in the log book, as far as he is in a position to do so. Subsequent entries should be made and signed by the pilot or competent person.

3. A copy of the certificate of airworthiness should be kept in the pocket at the end of the aircraft log book.

4. All entries to be in ink, except in the case of journey and signal log books, the entries for these may be made in pencil in a rough notebook, but should be entered in ink in the log book every 24 hours.

In the event of any official investigation the rough notebook may be called for.

5. No erasures should be made in, nor pages torn from, any log book.

6. A copy of these instructions should be inserted in each log book.

I.—Journey Log.

(a) Type to which the aircraft belongs; its nationality and registration marks; the name, Christian names, nationality and residence of the owner; name of constructor and the carrying capacity.

(b) In addition for each journey:—

(i) The name, nationality and residence of the pilot and crew.

(ii) The place, date and hour of departure, the route followed, and all incidents en route, including landings and weather conditions.

II.—Aircraft Log.

(a) Type to which the aircraft belongs, its nationality and registration marks, the name, Christian names and nationality and residence of the owner, name of constructor and the carrying capacity, and capacity of tanks.

(b) Type and series number of engine, type of propeller, showing number, pitch, diameter and maker's name.

(c) Type of wireless apparatus fitted.

(d) Table showing the necessary rigging data for the information of persons in charge of the aircraft and of its maintenance.

(e) A fully detailed engineering record of the life of the aircraft, including all acceptance tests, overhauls, replacements, repairs and all work of a like nature (see specimen sheet, the form of which should be followed).

III.—Engine Log.

A separate log book shall be kept for each engine and shall always accompany the engine. It shall contain the following particulars:—

(a) Type of engine, series number, makers' name, power, normal and maximum revolutions of engine, date of acceptance and first date put into service; petrol consumption; oil consumption.

(b) Registration mark and type of aircraft in which the engine has been installed.

(c) A fully detailed engineering record of the life of the engine, including all acceptance tests, hours run, overhauls, replacements, repairs and all work of a like nature (see specimen sheet, the form of which should be followed.)

IV.—Signal Log.

(a) Type to which the aircraft belongs, its nationality and registration marks; the name, Christian names and nationality and residence of the owner.

(b) Place, date and time of the transmission or reception of any signal.

(c) Name or other indication of the person or station to whom a signal is sent or from whom a signal is received.

Considered quite seriously, it must be admitted that the keeping of these multifarious log-books is necessary to the proper conduct of civil aviation, though the work of making the entries day by day and journey by journey will be an infernal bore to those responsible for the job. Imagine the clerical work attached to a six-engined machine, which will have to carry nine log-books, each of which will have to be brought up to date once in every 24 hours.

Naturally every little trouble of each engine would have to be booked, and the only person who could do the booking would be the engineer in charge of the power-plant. One can imagine this unhappy individual wrestling with six refractory engines all day and sitting up all night writing an account of their ailments. Truly the engineer's life will not be a happy one.

During the war each engine had its own log-book, which, it was piously believed, was entered-up daily by the workshop officer in charge of that engine. One imagines that when more important work was in hand, such as keeping the machines in the air at all costs during the big German push in 1918, the officer in charge or his clerks occasionally forgot to enter-up the log-book. But as a rule each squadron had plenty of people—and a few to spare—to do its clerical work. The keeping of log-books in a civil aviation venture will be much more troublesome, for the ordinary commercial venture will not have the same excess of personnel.

It is possible that mistakes may occur in changing engines, for obviously when an engine is replaced the log-book of that engine must be extracted from the waterproof bag of the authorised pattern and handed out to the person who is to take charge of the engine. Care must be taken that the right log-book is transferred, otherwise all sorts of complications may follow. Thus is yet another task put upon the over-burdened practitioner of civil aviation.

A Great Task.

Somehow there is something inexpressibly funny in the idea of "a waterproof bag of a pattern authorised by the Secretary of State." One can imagine Mr. Winston Churchill solemnly presiding over a Selection Committee composed of Mr. Finnigan of Bond Street, Mr. Barrett of Piccadilly, Mr. Foot of the Patent Trunks, Mr. Macintosh of Mackintosh's rubber works, and the leading bag merchants of the Burlington Arcade, to choose and authorise a sealed-pattern waterproof bag for log-books.

In practice probably the officially approved waterproof bag will repose empty under the pilot's seat, while the journey and signal log-books travel in the pilot's hip-pocket and the aircraft engine log-books in that of the chief engineer. That is unless the Controller-General of Civil Aviation appoints a special examiner of waterproof bags at each aerodrome to see that all aerial navigators comply with Paragraph 2, Schedule V, of the Regulations.

Perhaps the most humorous notion is that, though the waterproof bag must be of the authorised pattern (Paragraph 2), the actual log-books themselves need only "conform in all essentials to the patterns authorised," and may apparently be printed in any type, Italic, Gothic, Græco-Roman, or catch-as-catch-can style. One would have imagined that if there was one thing in which absolute uniformity would have been demanded, down to the most minute detail, it would have been the log-books.

A Lost Opportunity.

In this matter it seems that the Technical Department has missed a great opportunity of displaying its brainwaviness. Obviously each engine log-book should be inseparable from its engine, so that all chance of the mixing of engine logs may be avoided. Therefore the inclusion of engine log-books with all the others in a common waterproof bag (albeit authorised by the Secretary of State) is evidently absurd, and the obvious thing to do is to order that every engine shall have attached to it, as an integral part of its structure, a fireproof locker of a pattern authorised by the Secretary of State, in which the log-book of that particular engine shall be carried.

A little ingenuity of the kind so often displayed during the war by the T.D. could evolve a locker which would necessitate the redesigning of all engines intended for civil aviation, would add at least 20 lbs. to the weight of each engine, and would entail the removal of at least the carburetters every time the engineer wished to enter-up the log-book. It might even be possible to arrange it so that the magnetos also would have to be removed once in every 24 hours to make the required entries in the log-book. And perhaps it might also be possible so to arrange matters that it would be necessary to redesign the engine-bearers and housings of existing aeroplanes to fit the engines altered to accommodate the log-book, for that would entail altering the whole front of the fuselage of every civil aeroplane.

One fears, judging by the neglect of such an opportunity, that the Technical Department of to-day is losing interest in its job, for it is not maintaining the war-time form of the Bolo House and its even more effective adjunct, Bolshevik Mansions, situated in the Lenin Way, W.C.2, the later home of technical trouble. Or else the Technical Department is losing its nerve.

Some Urgent Questions.

Taking them quite seriously, there is nothing much with which one can quarrel in the official requirements concerning the entries in the log-books. The entering-up of the Journey Logs will be a continual worry to organisers of joy-rides, who are required to enter the number of passengers carried in every trip of 10 minutes or so. And, judging by the Specimen Sheets published herewith, each of these little trips will mean a separate entry in the Aircraft Log also.

There is a point in connection with the Engine Log which deserves attention. Paragraph (c) requires a record of "hours run," as may be seen in the Specimen Sheet. But there is nothing to indicate whether this means running in the air only, or whether it includes running on the ground.

Some engines spend more time in running full bore on the ground or on the bench when being tuned-up than they do in the air. In some cases it is the fault of the engine, but in many cases it is the fault of the engine-tuner who is not content to leave well alone, but always tries to screw a few extra "revs." out of the unfortunate engine. Are these hours to be counted as "running," for purposes of calculating when the next overhaul is due, or are they not? The question is of considerable importance.

Also, in the case of joy-ride machines the question arises in another form. Machines with fixed engines (as opposed to rotaries) stand on the ground with their engines running slowly and their oil-pumps working—and supplying soot for the cylinders—while passengers are getting in and out. Though this slow running hardly causes any wear, it probably causes more soot in the cylinders than does running full bore, and so actually does more to cause a need for overhaul. Does it count in the "running time" or not? Perhaps the Air Ministry will issue a supplementary Direction on these points.

The Signal Log is a useful institution, for not only

(Specimen.) **AIRCRAFT LOG.**

Date.	Hour.	Commanding Officer.	Route.	Time in Air. Hours.	Time in Air. Mins.	Petrol consumed.	Oil consumed.	Water consumed.	No. of passengers.	Repairs or Replacements.	Remarks.	Signature of authorised person.
			Brought forward								Time in the air since last overhaul:— hours. mins. ..... Date of:—	

Carried forward.....

is it a check on the alertness of the commander of the aircraft, but it is an equally good check on the vigilance of the watchers at the various signal stations. That is, of course, if the Air Ministry takes the trouble to compare the aircraft signal logs with the returns of signals from the various stations. This subject is really a matter for the Aerial Police Force, of which one hopes to hear something official before long.

PROHIBITED AREAS.

We may now pass on to the question of Prohibited Areas, to which is devoted Schedule VI of the Regulations. This reads as follows :—

SCHEDULE VI.

PROHIBITED AREAS.

1. Each of the places named or described in the following list, with the land and territorial waters surrounding such place to a distance of three statute miles in all directions from its boundary, shall be a prohibited area :—

Whole of Scapa Flow.
Kirkwall Town.
An area enclosed by straight lines joining the following points : Tor Ness, Rora Head, Inga Ness, Mull Head, Old Head (Orkney Islands).
Thurso Town.
Cromarty Ness.
Invergordon Pier.
Dalmore Village, near Invergordon.
Aberdeen Wireless Station.
Montrose Town.
Broughty Ferry Castle.
Inchkeith Island.
Rosyth Dockyard.
Pitfirrane Park.
Forth Bridge.
Tynemouth, North Pier Lighthouse.
Elswick Railway Station.
Killingholme Air Station.
Cleethorpes Wireless Station.
Louth Railway Station.
Landguard Point, Breakwater (Felixstowe).
Parkeston Quay.
Ipswich Wireless Station.
Osea Island.
Shoeburyness Church.
Fobbing Church.
Tilbury Fort.
Purfleet Railway Station.
Barking Creek Mouth.
Waltham Abbey Railway Station.
Enfield Lock Railway Station.
Chatham Dockyard.
Teapot Hard.
Chattenden Farm.
Allhallows Church.
Grain Martello Tower.
Sheerness Dockyard.
Dover Castle.
Archcliffe Fort.
Lydd Railway Station.
Newhaven Station Harbour Jetty.
Fort Cumberland.
Spithead : namely, the space between a line from Lee-on-Solent Pier to Wootton Point and a line from Southsea Castle to Seaview Pier.
Portsmouth Dockyard.
Cosham Railway Station.
Fareham Railway Station.
Culver Cliff, Naval Signal Station.
Needles Lighthouse.
Southampton Docks.
Marchwood Park.
Hurst Castle.
Osmington Church.
Weymouth Pier.
Portland Convict Prison.
Turnchapel Railway Station.
Plymstock Railway Station.
Keyham Dockyard.
Devonport Dockyard.
Saltash Railway Bridge.
Penlee Point.
Thorn Island (Milford Haven).
Pembroke Wireless Station.
Old Milford Railway Station.
St. Ann's Head.
Barrow-in-Furness Town Hall.
Stevenston Railway Station.
Greenock Pier.
So much of Loch Long as lies north of a line drawn due east from Knap Point.
Carrickfergus Railway Station.
Grey Point.
Spike Island.
Haulbowline Dockyard.

2. The prohibited areas are more particularly shown in a map issued for the purpose by the Secretary of State.

3. The officer to give the signals and take the action mentioned in section 2 of the Aerial Navigation Act, 1913, shall be a commissioned officer in His Majesty's Naval, Military, or Air Forces.

4. The signals which may be given when an aircraft flies, or attempts to fly, over any of the prohibited areas shall be as follows :—

By day : three discharges, at intervals of not less than ten seconds, of a projectile showing smoke on bursting.

By night : three discharges, at intervals of not less than ten seconds, of a projectile showing red stars or red lights.

5. On such signal being given, the aircraft shall immediately land at the nearest practicable spot ; provided that, if it be approaching or flying over any prohibited area, it shall not, in descending, advance further towards or into the area.

6. If an aircraft is unable to land immediately in response to the signal, owing to stress of weather or other unavoidable cause, it shall make the following signal :—

By day : show, from the place where they can be most clearly seen from below, a red triangular flag, together with two black balls superimposed vertically one above the other ;

By night : wave a white light, at the same time extinguishing the side lights :

and shall, as soon as possible, land at the nearest practicable spot in the United Kingdom.

It may be noted that neither the "Order of the Secretary of State"—with which these articles began—nor Schedule VI itself deigns to explain why certain areas are prohibited. The whole thing is left delightfully nebulous, except for the plain statement that everything within three miles of the points specified in the foregoing list is in a prohibited area.

The only reference in the "Order" is under the heading "Penalties," No. 10, Paragraph (4), which says :—

"(4) Any aircraft which flies or attempts to fly over a prohibited area is liable to be fired on in accordance with section two of the Aerial Navigation Act, 1913, and the provisions of these regulations relating thereto."

(SPECIMEN.) **ENGINE LOG.**

Date.	Hour.	Engineer in charge.	Revs. per min.		Time run.	Defects found.	Particulars of overhaul or replacement.	Remarks.	Signature of authorised person.
			On gr und.	In air (state climbing or level).				Time run since last overhaul :— hours. mins. ..... Date of :—	

From which one might surmise that the Government intends to maintain strong Archie batteries at or in all the areas mentioned in Schedule VI. If so, it will be an excellent thing for the A-A. Gunners, who rather feared that their occupations and their opportunities of practice have gone for ever. As it is, it seems that there will be plenty of work for them to do, for it is practically impossible for any aircraft to make an important journey in Great Britain without trespassing on one or other of these foolish areas.

Absurd Restrictions.

Frankly, the list of areas is absurd. For example, no seaplane, except a Government machine, may fly from Brighton to Bournemouth unless it goes outside the Isle of Wight, or at least three miles inland from Seaview, or three miles inland north of Cosham railway station.

Cutting out Spithead, and three miles west of Wootton and Lee, kills all flying over the Solent, which is the ideal area for sporting seaplanes. Cutting out a three-mile radius of Weymouth Pier kills all sporting flying in Weymouth Harbour, another almost ideal area. Cutting out the Forth Bridge spoils flying over the Forth. Cutting out Tynemouth and Elswick spoils the Tyne. Cutting out the Osea area spoils the Blackwater and Malden district. The Sheerness area kills the Medway as a school for water-fliers.

One cannot fly from Hastings to Brighton except by going three miles out to sea or three miles inland, because of Newhaven Harbour. One cannot fly over Plymouth Sound. One cannot fly over Milford Haven. One cannot fly over Loch Long. Spike Island and Haulbowline cut out the beautiful area of Queenstown Harbour.

And all this lest some enterprising foreign spy should take a few photographs of places which are already better known than the Bible to the Intelligence Department of every foreign nation.

Nearly all of this Prohibited Area business is too damned silly for words in these days. There was a little sense in it when the idea was started in 1910 or thereabouts, for there was a danger of the machines of the period falling into magazines and so forth. But to-day the whole scheme is merely ridiculous.

If the Naval and Military authorities—apparently it is almost entirely a matter of the Navy—are so keen on preventing anybody from photographing their old stores and barns and rocks and things they can use these buildings as a means of keeping their camouflage artists and dazzle painters in practice. The camouflage can be altered every two or three months, so as to make the last-taken photographs useless.

The Dazzle-Paint Humbug.

Incidentally, dazzle-painting aeroplane sheds is almost as silly as the Prohibited Areas. One happened to go to Hendon recently over the top of Hendon Hill instead of by the Edgeware Road for the first time in nearly five years. The sheds, which formerly faded away into the landscape now stand out in their motley paint till they are the only thing in the landscape. Many pilots have told one the same thing about other aerodromes. In fact they like dazzle-painting because, they say, it makes it so much easier to find the sheds in bad lights.

From that point of view dazzle-painting is useful, but as a camouflage it is futile. It would be interesting to know how many tons of precious paint have been wasted and how many able-bodied young men have been kept out of the trenches by this cleverly boomed humbug about dazzle-painting of buildings.

However, that has but little to do with the question of Prohibited Areas, except as suggesting another means by which the Navy can go on wasting public money which could be spent to better effect, as well as more intelligently, by other people—the Air Ministry for example.

No definite penalty is specified for flying over a Prohibited Area, except that the Archies may fire at the offender. The punishment seems to fit the crime, for the chances of being hit would be very minute, except perhaps in the London Air Defence Area, where the gunners are properly trained. The Naval gunners at the seaports could be (as a rule) trusted to miss a Zeppelin at 300 yards, unless it happened to be on the water, and then they would probably make quite good shooting at 17,000. One judges by Naval gunners' efforts to hit the Gallipoli Peninsula or anything else that is not actually on sea level.

Probably other penalties are specified in some out-of-the-way corner of the Act of 1913, but the sporting aviator will doubtless find ways of escaping those penalties, just as he eludes the Motor Car Act. But, as one has ventured to suggest as mildly as possible, nearly all of the Prohibited Area business is just about as idiotic as are the provisions of the said Motor Car Act.

The Next Instalment.

The next and, one hopes, the concluding section of these notes deals with "Rules as to Lights and Signals and Rules of the Air" and "Rules as to Aircraft Arriving in or Departing from the United Kingdom." Some of them are sensible, some silly, and some merely funny without being vulgar—as is the habit with our Laws.—C. G. G.

AN INTERNATIONAL EVENT FOR GREAT BRITAIN.

The Fédération Aéronautique Internationale has decided to revive the Schneider Cup Race this year. The competition was last won by Mr. (now Captain) C. Howard Pixton on a Sopwith Baby Seaplane (100 h.p. Monosoupape engine) at Monte Carlo early in 1914, so that this year the race will be held in British waters. It is worthy of note that this is the only International event ever won by a British aeroplane.

One gathers that the race will be held in September of this year, and that certain South Coast towns are being considered as the starting and turning points of the course. One suggests that the Southern holiday resorts should compete for the honour, and that those selected should put up subsidiary prizes for minor seaplane events, so as to organise a big "Seaplane Week" as an attraction for visitors.

The conditions of the race will be altered this year in a few important particulars. The total distance will be 200 nautical miles, instead of 150 nautical miles as formerly. Also the competitors will start when ordered to do so, at stated intervals—as in a motor-car road race—instead of starting when they please and merely flying against the watch. A competent Committee will decide whether the day is fit for flying or not.

As formerly, the competitors must cross the starting line in the air and must make two alightings on the water when they wish during the race.

Further details of the rules will be issued by the Royal Aero Club in due course.—C. G. G.

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ON THE TRANS-ATLANTIC ATTEMPT AND SOME CRITICISM.

Writing in the "Morning Post" of May 23rd, Mr. Massac Buist, who, before the war, did much good work for aviation by his articles in that excellent paper, sets forth to justify the trans-Atlantic flights, and devotes considerable space to an attack on THE AEROPLANE, which, however, he omits to mention by name, though he quotes direct from it. Here is what he says:—"In quarters the least expected, because nominally concerned wholly with championing aviation, we find it being argued that the missing heroes would have served the purpose of aeronautics better if they had never made their attempt, and that the energy, care, ingenuity, and hard work which have been wasted, and are being wasted, on Transatlantic attempts would have been much better devoted to organising flying-boat services along the great rivers of the world, and so on.

"As for the contention that enterprise devoted to the end of flying the Atlantic would have been much better diverted to organising flying-boat services along great rivers and so forth, it fails on the score of logic. The two undertakings call for quite a different class of enterprise. In the case of flying the Atlantic the specific endeavour is to demonstrate whether the range of action of the given machine is sufficient to link the New World with the Old by air route, and whether the science of aerial navigation pure and simple, without adventitious aid of any sort, is capable of enabling such a voyage to be made under carefully chosen weather conditions.

"Progress in aeronautics, as in other forms of travel, has been marked at every stage first by uncommercial achievement. Trans-ocean flying services of a commercial character will be the direct outcome of the essentially uncommercial and unsafe attempts of aviation pioneers engaged in such feats as endeavouring to fly the Atlantic in one stage."

One can only imagine that Mr. Buist wrote the foregoing as the result of being out of touch with aviation for so long—at any rate, one has not seen him more than once or twice in the last few years in those places where practical aviators meet and discuss the topics of the day. Nor, apparently, has he kept his ideas up to date by reading this paper regularly, for if so, he would not have referred to this as being an unexpected quarter from which to receive criticism of the trans-Atlantic flight.

At no time has this paper displayed any enthusiasm for the scheme, which it has always regarded purely as a newspaper stunt, just as it regarded the "Circuit of Britain" in 1911 as a newspaper stunt.

The prize offered for the Circuit of Britain could have been spent to far better purpose in encouraging British aviation, and the competition itself caused a set-back to flying because it displayed the unreliability of the aeroplanes of the period and disappointed the public. Also, it caused a number of comparatively poverty-stricken aeroplane firms to spend a lot of money which could have been put to better purposes in the interests of aviation.

The trans-Atlantic competition is precisely the same. The same amount of money could be put up for competitions which would do far more to improve British aircraft and would increase public belief in aviation. But—and there lies the crux of the whole matter—the Northcliffe Press would not receive the same amount of free advertisement in all contemporary newspapers.

The amount of money which is being spent by the competing firms in shipping machines and crews and mechanics to Newfoundland would assuredly bring better results if spent in a great co-operative propagandist scheme in foreign countries, using the same machines and crews for demonstration purposes. Therefore one adheres absolutely to one's remarks which Mr. Buist has quoted.

Incidentally, one would like to ask Mr. Buist what he means precisely by the sneering phrase "nominally concerned wholly with championing aviation"? One does not propose to make unnecessary trouble by bringing a libel action against Mr. Buist for a statement which would be of a distinctly damaging nature if anybody on the inside of aeronautics attached any weight to Mr. Buist's latter-day opinions, but one would like to know what he means, and herewith one offers him any reasonable amount of space (not greater than a page of this paper) in which to explain himself.

ANALOGY IN ENTERPRISE.

One quite agrees with him that flying the Atlantic and working a campaign for the true benefit of aviation call for different classes of enterprise. But one holds that the Bristol Merchant Venturers—those half-traders, half-pirates of the Spanish Main—and the British East India Company did very much more for the development of the British Empire than did all the explorers of Polar ice and Saharan deserts put together. And there is something very like a strict analogy between the classes.

When Mr. Buist writes that "the specific endeavour is to demonstrate whether the range of action of the given machine is sufficient to link the New World with the Old by air route, and whether the science of aerial navigation, pure and simple, without adventitious aid of any sort, is capable of enabling such a voyage to be made under carefully chosen weather conditions" he is writing pure unadulterated rot, for all his fine verbiage.

The range of action of the given machine can be demonstrated equally well by flying from Land's End to John o' Groat's and back, and then up to London. Or by flying round and round Brooklands track, for that matter. And the "science of aerial navigation pure and simple, without adventitious aid of any sort"—whatever all that may mean—can be demonstrated equally well without going across the Atlantic to do it.

It is quite true that "progress in aeronautics has been marked at every stage first by uncommercial achievement." Setting aside the doubtful English of the sentence, one knows well enough what Mr. Buist means. But that is quite possibly only a proof that progress would have been more rapid if we had stuck strictly to commercial achievement instead of wasting our substance on riotous adventures.

COMMERCIAL AND UNCOMMERCIAL ENTERPRISE.

On the other hand, Mr. Buist is again writing rot when he says that "trans-ocean flying services of a commercial character will be the direct outcome of the essentially uncommercial and unsafe attempts of aviation pioneers engaged in such feats as endeavouring to fly the Atlantic in one stage."

Apart from the question as to whether a flight with a £10,000 prize at the end of it can be styled correctly an "uncommercial attempt," Mr. Buist's reasoning is based on a pure *non sequitur*. It does not follow by any means that the future trans-Atlantic aeroplane service will be the direct outcome of winning the £10,000 of the Harmsworth Press. It is much more likely to be the direct outcome of a purely commercial air service up the Amazon or across Canada.

When flying-boats can run a regular non-stop service of 2,000 miles up and down the Amazon, or when an aeroplane service runs regularly non-stop from Toronto to Winnipeg, or from London to Baghdad, then we can begin to talk about "trans-ocean flying services of a commercial character." Meantime, flying the Atlantic remains a newspaper stunt; and a stunt, at that, which, because of the way in which the failures of competitors are advertised by the boomster Press, does a heap more harm than good to aviation.

A MATTER OF HEROISM.

The gallantry of those aviators who are resolved on making the attempt to fly the Atlantic is worthy of all respect. And in a set debate one might even be forced to admit that the example which their heroism sets to the British Race may outweigh the harm which the overbooming of their preparations, and attempts, and failures does to the progress of British aviation. But, as this paper, despite Mr. Buist's sneer, is wholly concerned with championing aviation—which is quite different from championing aviators—one is more concerned with the effect of the competition on aviation than with its effects on the British Race.

Nevertheless, one takes off one's hat to the aviators concerned, and one is very pleased that Mr. Hawker and Commander Grieve have been retrieved. Truly the ways of Providence are inscrutable. When one thinks of the number of one's friends—some of them men who were married and had families before the war—who are logged as missing for ever after flying for a few weeks or a few months over German gun-fire and under German "circuses" no more than a few miles beyond the British lines, it seems the more extraordinary that two men in one machine should have succeeded in thwarting the whole Atlantic Ocean and in finding safety a thousand miles or so from shore.

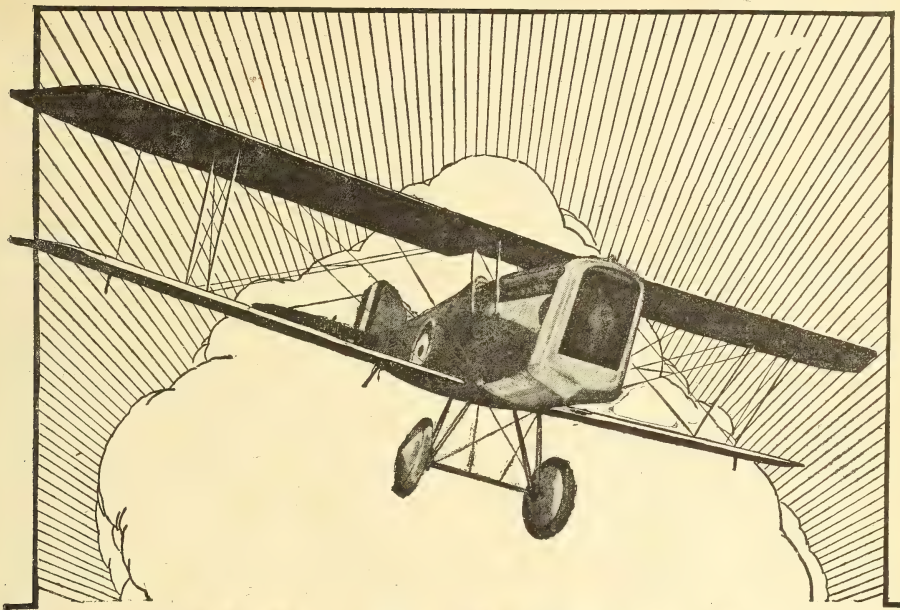
Surely, Mr. Hawker and/or Commander Grieve must be intended for some very great future. One hopes that they will stick together in all their further adventures, for one can never be sure to which of them the joss is attached.

Meantime, one wishes equally good fortune to all the other Trans-Atlantic fliers. If they cannot all succeed, one hopes that they will all fail gloriously and will all return home safely.

A PLEA FOR SANITY.

One yields to none in genuine admiration for the pluck of Mr. Hawker and Commander Grieve, but one cannot help feeling disgusted at the hysterical behaviour of the people of London over their performance. Naturally one expected the Harmsworth Press to open wide its most brazen-throated syrens. Its job is to get the utmost possible value for its £10,000. Business is business. But other papers, and the people at large, and the Royal Aero Club in particular, might have been expected to preserve a better sense of proportion.

So far as one is aware, no action has been taken by the Royal Aero Club Committee to celebrate the return of the many members of the Club who have crossed the German lines during the War, nor the rescue of those who were sunk in Hunland. Nor has one heard of its even taking steps to institute a permanent memorial to those who have fallen in the War. Certainly the Committee never made any Progress in State to welcome



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home those who had performed great feats of valour, such as the bombing of Düsseldorf, or Friedrichshafen or Constantinople, nor those who spent days at sea in derelict seaplanes.

The whole business is a splendid testimonial to the advertising value of the "Daily Mail" and its ancillary journals, but it does not increase one's respect for one's fellow-citizens. To quote a passage on another subject from the "Morning Post":—"About twenty years ago arose a new fashion in journalism, which consisted (briefly) in wholesale dealing in cheap sensation. The criterion of the importance of any event was not is relation to affairs of real moment, but the number of ignorant persons who would consider it interesting. Thus were the ignorant made more ignorant; and such taste and intelligence as they owned were systematically dulled. To debauch the taste of a nation in a single generation is an achievement. There are few enterprises more profitable; and few for which other people pay a higher price."

It does not occur to the ordinary reader of papers that perhaps the everyday flights of the little detachments of the R.A.F. which are fighting Bolsheviks in Russia are of greater importance to the future of this nation than are all the trans-Atlantic attempts, successful or unsuccessful, and that they are if anything more hazardous. Flying seaplanes over trackless forest is scarcely less dangerous than flying land machines over trackless sea.

Parliament always reflects the Press, few M.Ps having any minds of their own, and so one is but little more sickened by the fatuousness of the questions asked in the House during the past week.

However, presumably the uneducated tastes of an uneducated public can best be served by uneducated journalists—so long as journalism is purely a money-making proposition—and so we can expect nothing better than what we have suffered for the last week or so. What can one expect from a pig but a grunt—or a squeal? One did hope for a better sense of proportion in those more intimately concerned with aviation, but even they seem to have fallen victims to the prevailing Carmelite hysteria. One would merely like to ask them how they propose to celebrate the occasion when somebody achieves complete success?—C. G. G.

ROYAL AERO CLUB ANNOUNCEMENTS.

THE AUSTRALIAN FLIGHT.

The Royal Aero Club has issued the following rules relating to the £10,000 prize offered by the Australian Government for a flight from Great Britain to Australia:—

The Australian Government have offered the sum of £10,000 to be awarded to the pilot who shall first accomplish the flight in an aeroplane or seaplane from Great Britain to Australia in 720 consecutive hours.

The offer will remain open until midnight, December 31st, 1920, by which date the flight must have been completed.

The complete aircraft and all its component parts must have been entirely constructed within the confines of the British Empire. Raw material may be obtained from other sources.

The pilots and all the crew must be of Australian nationality, in accordance with the laws of the Australian Commonwealth.

ENTRIES.—Entries are to be made to the Royal Aero Club, 3, Clifford Street, London, W.1. The entry form, which must be accompanied by the entry fee of £100, must be sent to the Secretary of the Club at least seven days before the start is made.

All entry fees received will be applied towards payment of the expenses of the Royal Aero Club in conducting the competition. Any balance not so expended will be refunded *pro rata* to the entrants.

IDENTIFICATION OF AIRCRAFT.—Only one aircraft may be used throughout the flight. Individual replacements and repairs to the aircraft and motors may be made *en route*, but neither may be changed as a whole. In the case of a seaplane, it may be taken ashore for such repairs and replacements. Five parts of the aircraft and five parts of each motor will be stamped or otherwise marked, and at least two marked parts of each of these five parts must be in place on arrival at the control and at the finishing point.

STARTING PLACE.—The start must be made from Hounslow Aerodrome or Calshot Seaplane Station.

All starts must be made under the supervision of an official or officials appointed by the Royal Aero Club.

FINISHING PLACE.—The point at which the competitor must finish in Australia will be in the neighbourhood of Port Darwin, and will be announced later.

CONTROL.—A Control Station will be established on the route of the flight at Singapore. Competitors must alight at this control for purposes of identification.

TOWING.—Towing on the water is not prohibited, but the total distance of such towing must not exceed 100 miles, of which not more than 50 miles shall be consecutive.

TIMING.—The time of starting will be the time the aircraft leaves the ground or water, and the time of arrival will be deemed to be the time of crossing the coast line in the neighbourhood of Port Darwin.

GENERAL.

1. A competitor, by entering, thereby agrees that he is bound by the Regulations herein contained or to be hereafter issued in connection with this competition.

2. The interpretation of these regulations or of any to be hereafter issued shall rest entirely with the Royal Aero Club.

3. The competitor shall be solely responsible to the officials for the due observance of these regulations, and shall be the person with whom the officials will deal in respect thereof, or of any other question arising out of this competition.

4. A competitor, by entering, waives any right of action against the Royal Aero Club or the Australian Government for any damages sustained by him in consequence of any act or omission on the part of the officials of the Royal Aero Club or the Australian Government or their respresentatives or servants or any fellow competitor.

5. The aircraft shall at all times be at the risk in all respects of the competitor, who shall be deemed by entry to agree to waive all claim for injury either to himself, or his passenger, or his aircraft, or his employees or workmen, and to assume all liability for damage to third parties or their property, and to indemnify the Royal Aero Club and the Australian Government in respect thereof.

6. The Committee of the Royal Aero Club reserves to itself the right, with the consent of the Australian Government, to add to, amend or omit any of these rules should it think fit.

THE GRAND PRIX DE L'AVENIR.

The Royal Aero Club requests that THE AEROPLANE shall make known to the Aircraft Industry the fact that a new International Cross-Country Competition is being organised by the French paper *L'Avenir* under the regulations of the Fédération Aéronautique Internationale and under the patronage of the Aero Club of France.

There is no time in which to translate the rules in full, but the following is a brief outline:—

1. The Competition will be known as the "Grand Prix de L'Avenir." It is a cross-country competition of about 3,000 kilometres. Passengers will be carried. It is open to all French and Allied competitors and to all aircraft of French or Allied construction.

2. The prize fund is 100,000 francs, which has been deposited with the Aero Club of France.

3. Entries must be made with the Aero Club of France or with *L'Avenir* before 18 o'clock on June 30th. Entries will open on June 2nd, and must be accompanied by an entry fee of 1,000 francs, returnable if the machine covers the first stage of the course. Competitors must make known, not later than August 11th the names of the pilots of their machine.

4. Competitors must present at the Aero Club of France, before midday on August 9th, two registering barometers, which will be placed on their machines after verification. Machines must be presented at the starting aerodrome before 18 o'clock on August 19th, to be stamped with identification marks. Competitors will be allowed to present spare parts also for identification.

Two or three climbing tests will be made to determine the maximum load of the machine before starting. This load will be fixed in the following fashion:—The competitor will declare the said weight which the commissioners will admit after a flight in which the machine will start with the indicated weight, will climb to 3,500 metres in an hour at most, and will show on descending the starting weight minus normal expenditure of fuel and oil. In these tests dead weight will be carried instead of passengers. When this weight is fixed it will be inscribed on the fuselage or rudder of the machine.

5. Subject to modification, the course will be as follows:—

First stage—Paris to Angers *via* Rouen, La Havre, Deauville, and Dinard.
Second stage—Angers to Bordeaux by Romorantin.
Third stage—Bordeaux to Marseillies.
Fourth stage—Marseilles and Montpellier to Lyons.
Fifth stage—Lyons and Strasbourg to Metz.
Sixth stage—Metz and Lille to Paris.

Flying controls will be established along the course as well as obligatory landings. Competitors may start any time after 7 o'clock, and each control will be open from 7 to 20 o'clock, but nobody will be allowed to start after 15 o'clock.

The first start will take place on Sunday, August 24th.

6. Classification for the attribution of prizes will be as follows:—

(1) According to arrival at stages.
(2) According to a general classification which results from the addition of total points scored each day.

Ten points will be given to each machine covering a stage without landing during the day of opening the control.


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"Aviatics, Filton." Telephone 1906.
"The Bristol" Aeroplanes

A machine reaching the control the day after the opening shall only count 7 points.

Any machine has the right to cover two stages or more in a single flight if duly controlled.

Forced landings and breakages will be penalised as follows:—

For each landing, 1 point.

Change of wheel, airscrew, skid, elevator, rudder, or springs, 1 point; radiator, 2 points; cylinder, 5 points; crankcase, 5 points; wing, 5 points.

Every machine must carry a pilot and passenger. Passengers must weigh at least 65 kilos and must be at least 18 years of age. A quarter of a point will be added for each passenger carried over and above the regulation pilot and passenger. No passenger will count unless carried for a whole stage.

7. The 100,000 francs will be partitioned as follows:—

(A) 50,000 francs for the general classification of arrival.

(B) 50,000 francs for classification on points at each stage.

(A) General Classification.—First prize, 20,000 francs; second prize, 15,000 francs; third prize, 10,000 francs fourth prize, 5,000 francs.

(B) Stage Prizes.—10,000 francs for each stage, divided into first prize, 3,000 francs; second prize, 2,000 francs; third to seventh prizes, 1,000 francs each.

L'Avenir is endeavouring to arrange for military pilots of the Allied Nations to compete with the consent of their respective authorities, in which case special rules for them will be published later.

MR. CHURCHILL IN A FLYING ACCIDENT.

On May 19th, Mr. Churchill arrived at Buc Aerodrome, intending to fly over Paris, but as the machine was taking off it ran into a concealed ditch and the under-carriage was smashed. It is thought that the pilot was unfamiliar with the aerodrome. Neither Mr. Churchill nor the pilot was hurt.

On May 24th Mr. Winston Churchill, accompanied by Colonel Scott, arrived at Lille by aeroplane, having visited the devastated regions between Ypres and Dixmude.

GENERAL HENDERSON'S NEW APPOINTMENT.

Lieut.-General Sir David Henderson, K.C.B., K.C.V.O., D.S.O., late Director-General of Military Aeronautics, has been appointed Director-General of the newly formed League of Red Cross Societies.

GENERAL SYKES FLYING AGAIN.

On May 19th, Major-General Sir F. H. Sykes, K.C.B., C.M.G., who has resumed his duties at the Air Ministry, flew to Paris. The aeroplane left Kenley Aerodrome at 4 p.m. and reached Buc Aerodrome at 6 p.m.

THE AIR CONVENTION.

The following was issued in Paris on May 26th:—

The Aeronautical Commission of the Peace Conference held its final meeting on Thursday, May 22nd, and a complete draft of the Air Convention and its annexes was considered, and, subject to some small amendments, was agreed to. It was further decided to submit the Convention to the Supreme Council as an appendix to a final report summarising the work of the Commission. The Convention itself deals with the following matters:—

(a) General principles governing the rights of international flight.

(b) The nationality and registration of aircraft.

(c) Certificates of airworthiness and competency.

(d) Principles governing flight over foreign territory.

(e) Rules to be observed on departure or landing and when under way.

(f) Prohibition of the carriage of certain objects.

(g) State aircraft.

(h) The International Commission for air navigation.

(j) Final provisions.

Technical details are relegated to annexes in the following order:—

Annex A.—The marking of aircraft.

Annex B.—Certificates of airworthiness.

Annex C.—Log books.

Annex D.—Rules as to lights and signals and rules of the air.

Annex E.—Certificates of competency, including medical requirements.

Annex F.—International maps and ground marks.

Annex G.—Meteorological information.

Annex H.—Customs.

The preparatory work of drafting the Convention was in the main divided between two sub-committees, the Legal, Financial, and Commercial Sub-Committee being responsible for the text of the Convention and of Annex H, and the Technical Sub-Committee for the text of the technical annexes A-G. The Commission itself, however, has been responsible for the final approval of the different drafts with the help of a small drafting committee.

A ROYAL AERO CLUB LUNCH.

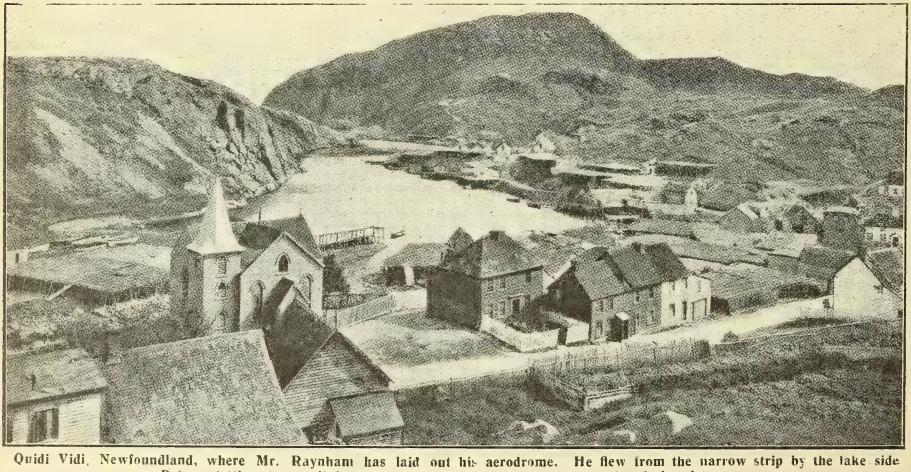
A luncheon will be given by the Royal Aero Club to Mr. H. G. Hawker and Commander K. N. Mackenzie Grieve, R.N., at the Savoy Hotel, on Friday, May 30th, at 12.45. Members should apply for tickets to the Secretary's Office, Royal Aero Club, as the accommodation is limited. The price of the tickets (which are for members only) is 30s. each.

AVIATION AS AFFECTING INDIA.

Brigadier-General Lord Montagu of Beaulieu, Adviser on Mechanical Transport Services to the Government of India, will read a paper on "Aviation as Affecting India" at a meeting of the Royal Society of Arts on Thursday, June 5th. The chair will be taken by Major-General Seely, M.P. The paper will be illustrated with lantern views.

CONGRATULATIONS.

DE BOLOTOFF.—On May 22nd, at 30, Portman Square, London, W., Dorothea Rosalie Buckingham (*née* Selfridge), the wife of Serge de Bolotoff, of a daughter.



Quidi Vidi, Newfoundland, where Mr. Raynham has laid out his aerodrome. He flew from the narrow strip by the lake side. Before getting to sea it is necessary to cross the hills on the right of the picture.

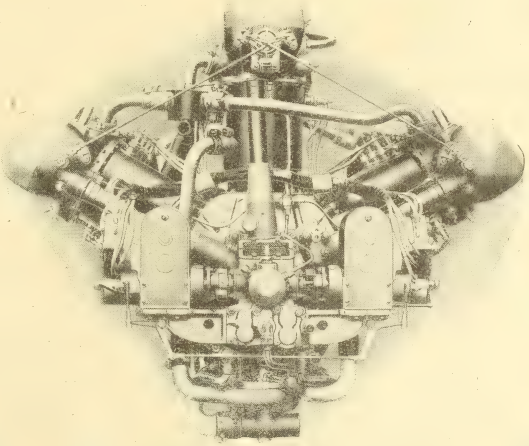
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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

Not Trained at Stonehenge.

A famous aircraft constructor who is noted for the ingenuity of his ideas suggests a practical method of getting rid of flies in rooms during the hot weather. After dark one enters the room and switches on the light. Then one stirs up all the flies with a towel and sets them all flying. As soon as they are well away at top speed one switches out the light, and the flies all crash landing in the dark. At least, so he says.

American Capacity.

The American "Aircraft Journal" states that:—

"Second Lieut. Oliver L. Locklear, Army aviation instructor, is so firmly convinced that a non-stop flight from New York to San Francisco is a certainty that he is planning to attempt one as soon as he gets out of Uncle Sam's service.

"The big feature of his plan will be to take on gasoline through a dangling tube from other 'ships' high in the air at various points along the route. The number of times it will be necessary to refill his tank will depend altogether upon the capacity of his tank."

And not upon the span and gap as might have been supposed.

In the event of the "dangling tube" fouling the airscrew a non-stop flight to earth seems probable.

More Imbecility.

According to Reuter, Lieut. O. Locklear, formerly with the U.S. Army Air Service, demonstrated on May 24th the possibility of passing from one aeroplane to another while in flight by catching a ladder dangling from the aeroplane passing overhead.

Both aeroplanes were at an altitude of 2,500 ft.

Lieut. Locklear claims previously to have dropped from a higher to a lower aeroplane while in flight, but this is the first time he has mounted to a higher aeroplane.

The feat was witnessed by the thousands who were attending the Pan-American Aeronautical Convention here.

After this one presumes that a number of correspondents will write to their favourite newspapers to suggest that all aeroplanes should be fitted with ladders in order that the pilot and passengers could descend in safety in cases of emergency.

One wonders whether Mr. Locklear is any relation to the late King Lear, another distinguished lunatic.

The War in the Air Pictures.

One gathers that the excellent R.A.F. pictures now being exhibited at the Grafton Galleries, Dover Street, will be closed to view at the end of this month, and, therefore, all readers who wish to see them should do so forthwith.

One is informed by a recent visitor to the Exhibition that quite an amusing afternoon's sport may be obtained by visiting the Exhibition with an old catalogue, as apparently the numbers on the pictures have been changed since the catalogue first appeared. For instance, he alleges that one gazes at a picture of a beauteous damsel drinking a cup of tea, and on referring to the number in the early edition of the catalogue one is confronted by the amazing statement—"To look at this picture one would think that a hedgehog had burst." This legend properly attaches to a picture of a large bomb in full blast.

Demobilised Staff Officers, One Presumes.

An American journal tells the following stories:—

"Recently a Government-trained aeronautical engineer was asked by a member of a prominent airplane company if he knew the ceiling of the JN-4H. Hesitating for a minute the engineer replied: 'Oh, yes. It is linen doped and varnished.'

"In commerce lapses now and then may be overlooked, but the salesman of a low-priced machine, who not long ago told a well-known flier that the 'factor of safety' of the machine he was selling was '30 miles per hour' really needs admonition from his employers."

An Official Address.

The ways of the airman who would be demobilised pass all comprehension. The latest story concerns one somewhere in the Eastern Counties, who, having expressed his desire to be demobilised, was told that he must apply to Bircham Newton—this being the name of the aerodrome at which his Group Headquarters were situated. In due course, thanks to the intelligence of the Post Office, there arrived at Group Headquarters, a letter addressed to "Messrs. Bircham and Newton," and beginning with the word "Gents."

Out of his Bearings.

The "Aerial Age" of New York publishes the following somewhat clumsily told story. It will be noticed that the Americans consider the word "plane" synonymous with "ship."

(Lieutenant Thompson is an Air Service cadet watching the mechanics tune up his plane for his first solo flight.)

Lt. Thompson to Mechanic: "What's the trouble with this ship?"

Mechanic to Lt. Thompson: "Sir, the bearings are burned out." (Lt. Thompson looks at mechanic in astonishment.)

Lt. Thompson to Mechanic: "I thought these ships were equipped with fire extinguishers?"

Mechanic to Lt. Thompson: "Yes, sir, they are."

Lt. Thompson to Mechanic: "Well, why didn't you use it?"

Caribou-hunting by Aeroplane.

The fears of those sportsmen who have regarded with dismay the possibility of caribou being hunted with aeroplanes have been soothed by a long article in the "Times." This article by C. Gordon Hewitt, Consulting Zoologist, Department of Agriculture, Ottawa, Canada, in its entirety is somewhat narcotic in its effect, but the following paragraph is startling:—

"The idea of hunting caribou with aeroplanes is not new. Similar proposals have been made by different people at various times since the development of the aeroplane and its use in the war; some enthusiasts have added maxim-guns to their means of offence. But to all such suggestions a deaf ear has been turned. During the war repeated efforts were made to secure a general relaxation of the game laws to permit the killing of game for food owing to the high price of meat. The Canadian Government resolutely opposed any such action, and a similar firm stand was taken by the provincial governments. It was realised that any such relaxation of the laws and the resulting excessive killing would mean the destruction almost to the point of extermination of many species of our game animals."

So one learns with relief that for the present there is no need for caribou to dig themselves in when they hear aircraft approaching. One trusts that the caribou have been informed.

Distinctly American.

An American journal gives a spirited account of a looping performance by Lieut. P. W. Maynard. Following is an extract:—

"With a determination to exceed Lieut. Joyce's record, he climbed into a Sopwith-Camel, in which he had had a narrow escape a few hours earlier by coming out of a 1,200 feet fall dangerously near the ground, enough to daunt the average flier. He shot off the ground straight toward the silvery reflection of the big full moon, the 160 Monosoupape motor making the flight spectacular.

"Securing enough altitude, approximately 2,000 feet, he started on his record-breaking looping journey. He simultaneously circled the field so that 50 to 52 loops would be made in each circuit, averaging five loops a minute, or, rather, 12 seconds per loop. By the time he had circled the field over six times he had broken the world's loop record for time and number.

"It is reported that his previous greatest number of loops was 16, although his acrobatic skill had been previously demonstrated in the execution of vrilles, sideslips, Immelmann turns, barrel rolls and sky-rock rolls. In addition to his regular performance he executed 18 loops after his main pressure gasoline supply tank became empty, for instead of gliding to earth he switched on his gravity emergency tank and threw in the extra loops for good measure nearer the ground. On account of the known fact that the gravity feed is useless in the upper halves of the loops, while the plane is upside down, this added further zest to the trip."

At this point one feels the necessity to pause for breath. The first problem is in connection with the silvery reflection of the big full moon. It will be noted that he shot off the ground towards the reflection of the moon, which it is to be presumed was mirrored in the sea or a lake. Possibly he dived off a cliff, which seems a somewhat risky proceeding at night.

With regard to "barrel" and "sky-rock" rolls, these appear to be new evolutions, and one prefers not to hazard a guess as to their nature. One may, however, question "the known fact that the gravity feed is useless in the upper halves of the loops." Theoretically, centrifugal force acting on the petrol would balance gravity, and in practice no difficulty is experienced in looping when the fuel supply depends upon gravity.

The entire article may be best described as—well, American.

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The Autocar, Feb. 8th, 1919.

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ROLLS-ROYCE

The WORLD of AERONAUTICS (continued)

A Mythical Aerodrome.

The following amusing account of the results of an Air Ministry blunder appeared in the "Daily Mail":—

A correspondent, in a hurry to get from London to Plymouth, consulted the Air Ministry's list of civil air routes. He found there was an aerodrome at Cattewater, near Plymouth, and telephoned to Col. Henderson at the Hounslow aerodrome. The correspondent proceeds:—

"We fixed up terms in less than a minute. I sent for a taxi-cab, secured one—which was miraculous—and drove straight to Hounslow. Within five minutes of my arrival there I was in the air. We arrived over Plymouth at six o'clock.

"Col. Henderson, who was piloting the machine, shouted to me that he could not see the aerodrome. Nor could I. After circling over Plymouth for some time we landed in a field and asked our way. The first passer-by had never heard of an aerodrome in the neighbourhood. The second thought there was one somewhere. The third was 'a stranger in these parts.' The fourth, or fifth, or sixth, I forget which, said he did know that aeroplanes sometimes came down over by the naval station at Cattewater—on the golf links, he thought. He had seen some smashed up there.

"Cheered by this news, we rose and made for the naval station. We came down to a few hundred feet and observed a stretch of unfenced ground seared with trenches and covered in places with bunkers and wire fences. Somewhere among these hazards, by most skilful piloting, Col. Henderson managed to side-slip in and make a landing.

"Then we waited. We still wondered where the aerodrome was. An R.A.F. officer appeared and said we were on the aerodrome. This place of trenches and wire fences was a terminal 'station' within the meaning of the Civil Aviation Regulations. He was apologetic for the aerodrome—in fact, he admitted that it wasn't one really."

The sequel came the other day in an Air Ministry statement, which, after admitting that Cattewater had been announced as "one of the stations which it was proposed should be used jointly by Service and civil pilots," says Cattewater is in a prohibited area and "is a seaplane base and not a land aerodrome."

All of which confirms one in one's view that most official communiqués are—to quote Mr. Rudyard Kipling—"based on conformable strata of absolutely impervious inaccuracy."

A Grave Omission.

One is glad to hear that the authorities of medium altitude pertaining to the R.A.F. still continue their amusing habits. One of the latest efforts consists in a series of letters from a brass-hatted gentleman at a Salvage Depôt to a firm of contractors somewhere in the British Isles, complaining bitterly that machines numbered umpty something or other—which happen to be surplus nacelles of obsolete pusher biplanes never completed—have been delivered to his depôt minus the proper log-books recording their flying career, and requesting the firm to give their immediate attention to the matter.

A Seaplane Endurance Test.

The Air Ministry has issued the following statement:—

"In view of the recent trans-Atlantic achievement of the American seaplanes the following details with regard to an endurance test just carried out by a British service seaplane are particularly interesting.

The type of seaplane used—an F.5—was an ordinary production machine, and was fitted with two 350 Eagle VIII Rolls-Royce engines.

The ascent was made from Felixstowe at 8.20 p.m., with Captain Scott, D.S.C., as pilot, Captain Dickey, D.S.C., as navigator, and two mechanics. Weather conditions were good once the machine was in the air, but a choppy sea was running at the time, and before taking off a certain amount of water was shipped. Moreover, the direction of the wind and this condition of the sea rendered it necessary to taxi outside the harbour for some distance before actually taking off, which reduced the amount of petrol actually available for the flight

The course followed was a coastal one, passing Margate, Eastbourne, Bognor, Brighton, Folkestone, Ramsgate, Sheerness, Cromer, Southwold, Lowestoft and back to Felixstowe. No attempt to land was made until the engines actually stopped from lack of petrol. This, of course, was done deliberately as a test, and the machine was flying continuously for no less than 14 hours and 8 minutes, or, including getting out of harbour, 14½ hours, landing at Felixstowe again at 10.20 a.m. the following morning.

No engine trouble of any sort was experienced, and had more petrol been carried the flight could have been considerably prolonged.

An important point to remember in connection with this very creditable achievement of the British machine is that no special modifications were made, and the ordinary service load was carried. The total weight of the machine with crew at the time of ascent was 13,710 lbs., of which 150 lb. was water shipped in the choppy sea before taking off. The average speed maintained was about 55 knots, and wireless communication was maintained with the base at Felixstowe throughout the flight.

An Experiment.

A giant 1,600 h.p. (four Rolls-Royce engines) Handley Page aeroplane made a non-stop experimental commercial flight on May 24th from Belfast to Folkestone, and travelled 520 miles in six hours. The pilot was Mr. Clifford Prodger, and among the passengers was his partner, Mr. Bernard Isaac, one of the pioneers of commercial aviation in 1909.

Although at times the speed was over 100 m.p.h., the main part of the journey was carried out with the motors throttled down to cruising speed, and the speed averaged nearly 90 miles per hour over the whole journey.

Demobilised.

The following aerodromes and landing grounds have been relinquished by the R.A.F.:—

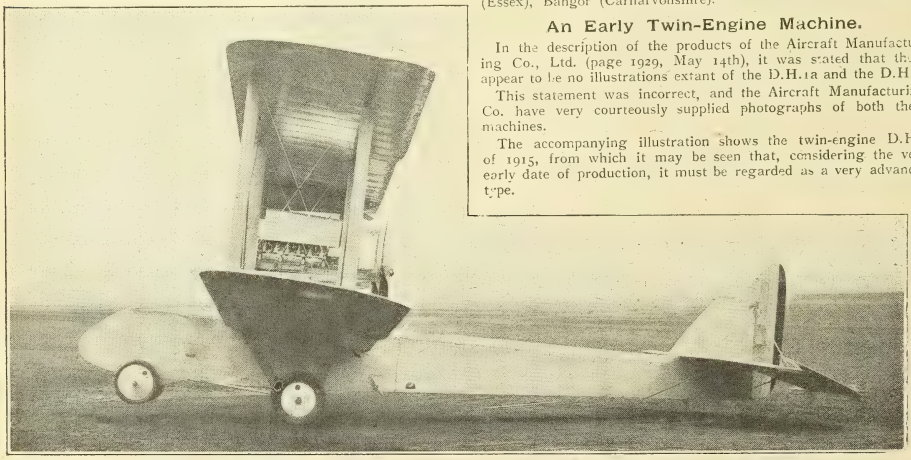
Kilconquhar (Fife), South Ash (Kent), Bellesize (Yorkshire), Stanstead (Hertfordshire), Telscombe (Sussex), Goldhanger (Essex), Bangor (Carnarvonshire).

An Early Twin-Engine Machine.

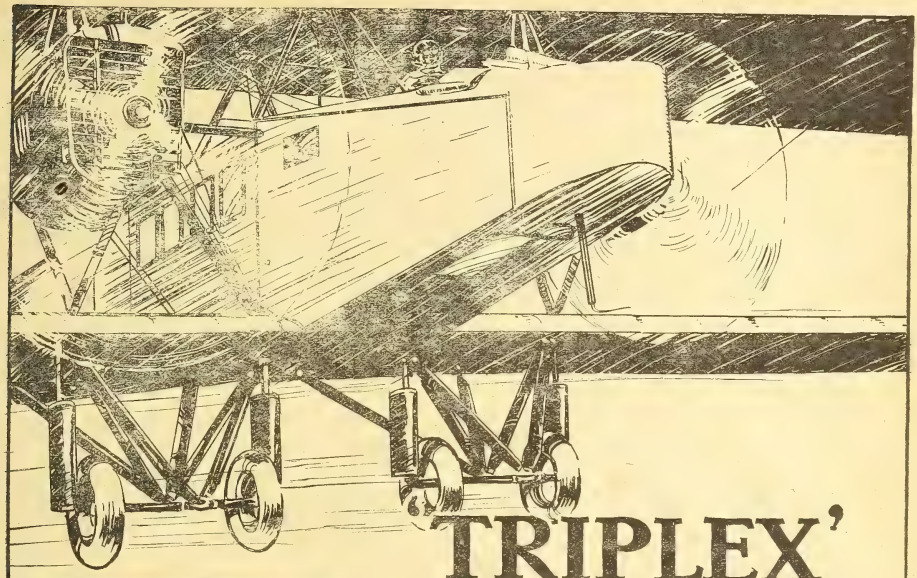
In the description of the products of the Aircraft Manufacturing Co., Ltd. (page 1929, May 14th), it was stated that there appear to be no illustrations extant of the D.H.1a and the D.H.3.

This statement was incorrect, and the Aircraft Manufacturing Co. have very courteously supplied photographs of both these machines.

The accompanying illustration shows the twin-engine D.H.3 of 1915, from which it may be seen that, considering the very early date of production, it must be regarded as a very advanced type.



Side View of the Aircraft Co.'s D.H.3 (two 130 h.p. Beardmore Engines). When this machine was produced early in 1915, nobody in authority wanted to bomb Berlin. Engines were not available, so no more of the type were built. But, as may be seen, it is the direct ancestor of the D.H.10.



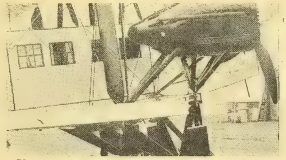
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The whole question of the public support of flying, and of the establishment of public confidence in travelling by air, depends much upon the provision of every possible safety precaution in machines employed for civilian service. Amongst the most important of these essentials is the stipulating of "Triplex" Safety Glass for all panels, windows and windshields, and for the eyepieces of goggles, for without this precaution many serious and perhaps fatal accidents must occur from flying splinters of glass on the least concussion or shock of landing. "Triplex" Safety Glass is absolutely and definitely unsplinterable under any impact or communicated shock. Catalogue No. 3 explains exactly what "Triplex" can withstand and how it is made.

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The WORLD of AERONAUTICS (continued)

218 Squadron's Dinner.

A dinner will be held by 218 Squadron Officers. Will those desiring to attend please write to Major Wemp, c/o THE AEROPLANE, 166, Piccadilly, W.1., immediately?

A Sportsmanlike Letter.

Last week one drew attention to the fact that some Handley Page machines had flown across Lord's during the progress of a match between Middlesex and Notts, and had caused a temporary stoppage of the game. On May 21st the "Daily Express" published the following :—

Handley Page aeroplanes have sometimes been described as "lords of the air," but the company which owns them has come forward in a sportsmanlike manner to deny that it makes any claim to the air of Lord's.

Mr. E. J. Bray, general manager of Handley Page Transport, Limited, writes to the "Daily Express" that he has sent the following letter to the secretary of the M.C.C., expressing his regret for the occurrence :—

"My attention has been drawn to an article in the 'Daily Express,' in which it is stated that one of our machines flying over your ground on Saturday interfered with the match then in progress.

"I much regret this, and can assure you, as an old cricketer, that I have already taken the necessary steps to prevent its recurrence."

A Long Duration Flight.

A Handley Page aeroplane, type V/1500 (four Rolls-Royce engines) carried out an endurance flight from an R.A.F. aerodrome in Norfolk recently. The machine, carrying a crew of five officers and three airmen, left the aerodrome a few minutes before 8 a.m. and returned at 7.40 p.m., no landing having been made in the meantime.

The total distance flown over the ground was 836 miles, corresponding to a mean speed of 72.8 miles an hour, with a load of 24,890 lbs. all on.

During the flight Birmingham, Southport, Manchester, Lincoln, London, Felixstowe, Yarmouth, and Hunstanton were visited.

Low Flying.

Sentence has been promulgated in the case of Flight-Cadet Harry Willoughby Ray, R.A.F., who at a recent district court-martial held at Upton, near Chester, was found guilty of two charges of flying at a low altitude, thereby damaging telegraph wires, and of flying to the danger of the public.

The sentence of the court was that Ray be discharged from the Service. The group commander confirmed the finding of the court, but commuted the sentence to 28 days' detention and forfeiture of all ordinary pay for two months.

It was stated that Ray flew very low over Grosvenor Park and the River Lee on Easter Monday when it was crowded with small craft. It was his final flight, as he was to have been demobilised that day.

A Queer Case.

Captain and Flt.-Cdr. W. G. Hinchcliffe, R.A.F., was committed for trial at Spilsby recently on a charge of stealing a motor-cycle and sidecar at Skegness. It was alleged that Captain Hinchcliffe took the cycle from a garage, and with the aid of a mechanic exchanged various parts of the machine. Captain Hinchcliffe said that on the way to the aerodrome his own cycle, of similar make to the one alleged to have been stolen, broke down. While engaged on the roadside repairing it a man came along on another motor-cycle, and from him he purchased parts to repair his own.

Another Queer Case.

An American dancing master, Arthur Joseph Maguire, 25, who had been a transport driver in the R.A.F., was sentenced to six months' hard labour, on May 23rd at West London Court, for obtaining £26 by a bogus cheque from Charles Henry Boeglin, manager of the American bar at Selfridge's. He had stated that he was attached to the American Embassy and had got an introduction from Miss Elsie Janis to Sir Alfred Butt.

The cheque was signed "R. V. Thornton," who, he said, was the general manager of the Great Eastern Railway. The cheque form had been stolen from a book in a West Kensington boarding-house.

The Case of Miss Douglas-Pennant.

At the meeting of the Executive Committee of the National Party on May 21st, the following resolution was passed, and copies have been sent to the Prime Minister, Mr. Bonar Law, M.P., Mr. Winston S. Churchill, M.P., and other Ministers concerned :—

"That in the opinion of this Committee the delay in fulfilling the repeated and explicit promise that there should be a full judicial inquiry into the dismissal of Miss Violet Douglas-Pennant is highly detrimental to the reputation of the Government and to national confidence in the public services."

The Official Answer.

According to the "Daily Mail," General Seely states that "the provision of parachutes is receiving the closest attention of the Air Ministry, but their development has not yet reached a stage in which compulsory universal provision would be either practicable or advantageous."

So now one understands why lives that might be saved continue to be sacrificed.

Kite-Balloon Aprons.

Dr. Prassone, director of the Italian Aeronautical Instruction Department, and Major Avorio, of the Italian Engineers, brought a claim before the Royal Commission on Awards to Inventors, at Westminster, on May 26th, with respect to a type of kite balloon which formed part of the "apron" of the defence of London during the air raids.

Mr. Whitehead, for the applicants, said the balloon was spherical in shape and filled with hydrogen. There was a conical appendix, and three further spheres, known as stabilisers, which were filled with air. The balloon only came into operation with the Air Force shortly before the close of hostilities, and it was claimed to be superior to other types in lifting power and stability. The balloons were used in the defence of London, the system being known as the "apron" defence. A pianoforte wire was stretched between two of the balloons and to this wire further wires were attached in the form of streamers, the object of which was to entangle an enemy aeroplane or other aircraft seeking to make its way to London, and so bring it down.

Mr. Trevor Watson, for the Treasury, said twenty-three balloons had been constructed at a cost of about £40,000, and while admitting that the invention was one of very considerable practical utility, and had very considerable advantages, he argued that it did not enable anything to be done that could not be done without the invention. He suggested a royalty of five to seven per cent. in addition to £500 in respect of expenses.

The claimants accepted the offer of £500 for expenses, but their Counsel asked for a ten per cent. royalty.

The Commission reserved its decision.

Wireless Telegraphy and Aircraft.

Mr. Godfrey Isaacs was the guest at luncheon of the Aldwych Club one day recently, and spoke on the future of commercial wireless telegraphy. Sir Arthur Pearson presided.

Mr. Isaacs said :—In dealing with the air he would speak only of the things which had been achieved. Aeroplanes and airships would play a very great part in the future, both in respect of travel and also of communication. Mr. Handley Page had said to him the other day that he thought he was going to compete with wireless in communication. He would not be able to do that until he could travel 12,000 miles without a stop in something less than a second. (Laughter.)

Whether they competed or not, it was the intention of wireless telegraphy to help the aeroplane and the airship. There was a simple means of communicating by wireless with aeroplanes and airships, and there was no doubt that the distance over which they would be able to communicate would increase considerably; in fact, it was increasing daily. The assistance which wireless could give to the aviator was great. It could provide him with the latest development of wireless direction. The wireless direction finder would enable the pilot to ascertain approximately where he was at any time.

A further development had given them a new transmitter, which would project into the air a wide divergent beam, something like a searchlight without the light, which would extend over any area required, or, if it was desired, a concentrated beam over some small place, and these beams would convey to the men in the sky automatically the name of the place they were passing over.

Assuming that a man was passing over the town of Guildford; from the moment he traversed the region over which this beam was playing he would receive the signal, "This is Guildford, and would continue to receive that signal so long as he was over Guildford and no longer. In just the same way, if he was passing over Windsor Forest he would be told: "This is Windsor Forest," and when he came to his aerodrome a beam would tell him, "This is Hendon Aerodrome." In that way he thought that one of the greatest dangers to pilots in fog and in darkness was disposed of.

It required very little imagination to see, a little while hence, some thousands or tens of thousands of names being projected into the skies, so that in whatever part of the world an aeroplane might travel it ould be told continuously and automatically where it was. It would be as easy to learn in the skies where they were as in a railway train when they looked out of the window to see the name of a station.

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PARIS NOTES

May 26th.

Dirigibles.

It cannot be said that interest in airships is ever more than spasmodic and lukewarm except among the few financially and scientifically interested in them, and even they, in their devotion, have a tendency to become industrially and aerostatically marooned. However that may be, with post-bellum days within measurable distance, the various societies interested are preparing for the commercial utilisation of their rigid or semi-rigid craft. For example, the Maison Astra have formed a Compagnie Transaérienne in Paris, with the intention of starting a trans-Mediterranean service, and also battlefield tours by airship: these latter will commence in June. Meanwhile Mr. Charles Dollfus has been granted facilities by the French Navy to take trips in a Navy dirigible, in order that he may collect data and formulate a proposition for a regular airship service between France and her North African Protectorates.

Then there is the Commission des Dirigeables of the French Aero Club, which is making serious efforts to get whatever powers that be (for the moment) to render aid in developing aerial navigation by airships on a large scale. Recently they addressed a resolution to the authorities, from which one gains an excellent idea of their industrial intentions and their mental attitude towards the late German Empire:—

1. That all construction of large airships (rigid) have their own "hangar de montage."

2. That the projects for hangars, studied by Naval Service of Hydraulic Works, be not abandoned, and that the Civilian Aviation authorities take over all such work begun and continue it in order to hand them over to the industry as and when finished.

3. That there be placed at the disposal of competent technical authorities an installation similar to that at Rome for the trials of motors intended for airships.

4. That France follow the example of England in employing State aid, in order to establish the industry of rigid airships on a broad and sound basis.

5. That France demand the four German hangars now erected at Namur and Duren, in Belgium.

6. That France demand five German rigid airships.

7. That France inquire into the German method of producing hydrogen.

8. That the French authorities experiment with a light varnish for the ballonets, and one less porous than rubber.

9. That trials for engines intended for service in large rigid machines last 1,000 hours for each type in ten trials of 100 hours each. These motors, which should have a normal h.p. of 300, must be capable of giving 350 h.p. at 1,200 to 1,400 r.p.m.

The Surplus Pilots.

Some are of opinion that French military aviation is being disintegrated too rapidly and that when commercial aviation commences in earnest, the men will not be available, whilst others are engaged in counselling pilots and mechanics to return to their pre-war occupations without delay. As the director of a large pre-war aviation enterprise put it, supposing after the war there are twenty aerial transport companies, which is improbable, but supposing they will certainly not need more than a thousand aviators, and the Army will probably only keep a thousand, which leaves several other thousands very much *en l'air*. This employer, who is promoting commercial aerial transportation on a big scale, told me his method had been hitherto to select "probables" from men who had won the Croix de Guerre, the Military Medal, and had a minimum of seven citations in Army orders, but his list had already reached 400, so he would perforce have to be more exigeant than he had intended!

"Landing on Water."

French philologists have been much exercised lately over the choice of a word to express the action of "landing" an aircraft on water, be it sea, lake, or river. "Atterrir" is certainly inexact, whilst "ammerrir" could only be used for descent to the sea. "Affletter," which seems excellent for the purpose, was almost decided upon, when someone suggested that there was no need to coin a new word when the French language already possessed a most admirable term in "*se penser*." There the discussion has ended. Such are the difficulties encountered with a language controlled by an Academy.

A Forced Landing.

Last Saturday the Farman Goliath left as usual for Brussels. It carried its full complement of paying passengers, several of whom were English business men. When nearing Brussels one of the motors stopped, the first time this has ever occurred since the route was opened, and Bossoutrot was able to bring the machine down close to the railway station at Papignies, whence the passengers reached Brussels in a short time. It is to be noted that Bossoutrot flew for well over a quarter of an hour with one motor only, which gave him sufficient time to find a suitable landing-ground, with the minimum of inconvenience to his passengers. The trouble was not serious, however, and the Goliath reached Brussels the same evening and returned to Paris according to schedule.

On Tuesday Mrs. President Wilson went out to Villacoublay and flew over Versailles in the Farman Limousine.

Civil Flying in France.

This last week has seen the abrogation of the French law of July 31st, 1914, forbidding all civilian flying in France, so that it is probable that pleasure flying and aerial cruises will become increasingly popular.

A New Type.

A new type of machine called the Marçay, with a 300 h.p. rotary engine and piloted by Lieut. Lebeau at Villacoublay, attained a speed of 252 k.m.h. near the ground. The following are its comparative speeds according to height:—

Near ground	252 k.p.h.
3,000 metres	237 ,,
4,000 metres	231 ,,
5,000 metres	220 ,,
6,000 metres	208 ,,

The Height Record.

It is probable that Lieut. Sadi-Lecointe, better known as Sadi, on a Spad-Herbemont machine, has beaten the height record set up by the American pilot named Schroeder. On his return to earth at Villacoublay his altimeter showed 8,900 metres, and it is now awaiting "homologation" by the Sporting Commission of the French Aero Club. The attempt was controlled by Capt. Laubignac and by Captain Toussaint. The machine was eleven months old and had seen war service, and was fitted with a 300 h.p. Hispano-Suiza engine. The only speciality was the airscrew, which was a "Lumière."

The Central Powers Board.

Under the presidency of Prince Roland Bonaparte, the Fédération Aéronautique Internationale decided to prohibit any representative of the Central Empires from participating in any international aerial manifestation before the formal constitution of the League of Nations.

A commission has been formed, with M. Surcouf as secretary, to revise the general rules of the F.A.I.; it was also decided to change the conditions for granting brevets to pilots, and also to change certain rules appertaining to the recognition of records.

The F.A.I. further voted unanimously the following resolution, which is to be transmitted to each of the Governments of the delegates represented at the conference:—

BELGIAN NEWS.

A committee under the patronage of the Belgian Aero Club has been formed at Brussels with the object of erecting a monument to the memory of Belgian aviators killed in the war.

On the initiative of the Overseas Bank a syndicate has been formed in Brussels to promote a powerful aeronautical company to exploit airways in Belgium and the Congo. All the leading Brussels banks and some of the French ones are concerned in the scheme.

SWISS NEWS.

Lieut. Wuest, who recently received the Diploma of the School of Aeronautical Engineering at Lausanne, has been appointed by the military authorities as Inspector of Swiss Aviation.

In order to make aviation as successful as possible it has been decided to combine passenger flights between Dubendorff and other big towns with the postal service.

A committee has been formed at Lugare with the object of organising an aerial service between that city and Lucerne.

The Swiss who were hoping to buy cheaply, and the Germans who were hoping to sell, their machines will be grievously disappointed now that General Nudant has reminded the latter that under the terms of the Armistice they are prohibited from selling their machines abroad, and that therefore the negotiations must cease.

The following appeared recently in a Swiss paper:—

"Aeroplane Construction.

"All the foremen and pilots of the most important German firm of aeroplane constructors, with the necessary technical apparatus, offer to establish and direct, abroad—if need be, overseas—a factory for constructing aeroplanes. Offers to No. . . at Rudelf Messe, Berlin."

Apparently it would be a "neutral" firm!

ITALIAN NEWS.

Major Rabbeno, writing from Leghorn, states that the Rabbeno-Magaldi patent amphibious alighting gear has now been fitted to an R.N. seaplane of the F.B.A. type, and that it has been incorporated in a new type of boat-body. Although sprung and contractable, the gear weighs less than 60 kilos for a machine weighing 1,400 kilos. The inventors feel certain that this percentage will be reduced very considerably in the case of bigger hulls, and see no limit in size or weight which would render the fitting of their device impossible.—T. S. H.

THE "SHELL" THAT HIT GERMANY HARDEST*

IT was the privilege of "Shell" to figure in two of those great crises which governed the entire course of the war:—

THE HIGH EXPLOSIVES CRISIS.—"But for toluol, *the war would have been lost*," declared M. Bérenger, Commissioner-General of Petroleum in France. It is toluol that gives its name to the T.N.T. (Trinitrotoluol) which was so extensively used by the Allies for shells, mines and bombs. Approximately 80 per cent. of Britain's entire output of toluol in the critical year of 1915 was supplied by "Shell." Addressing the Institute of Petroleum Technologists at their Annual Dinner some months after the Armistice, Sir Frederick W. Black, K.C.B., referred to the "Shell" group as having given us that valuable product toluol, from Borneo petroleum, without which we could not have defeated the enemy.

THE TANK TONNAGE CRISIS.—In the tank tonnage crisis of 1917, when all the vessels of the British Navy were wholly dependent upon liquid fuel, and the exercises of the Grand Fleet had to be curtailed on account of the acute shortage, "Shell" placed before the Admiralty the proposition of bringing liquid fuel from abroad in the "double bottoms" or ballast tanks of ordinary merchant ships, and, at the request of the Admiralty, "Shell" undertook the entire work of conversion. No fewer than 1,230 vessels were so converted, and 1,014,570 tons of liquid fuel were by these means brought over by the date of the Armistice, as a result of which the entire situation was saved. The tonnage represented by this enterprise was equivalent to a *new fleet of a hundred oil tankers.*

"SHELL" MARKETING CO., LTD.,
PARKER ST., KINGSWAY, LONDON, W.C.2



* "The 'Shell' that Hit Germany Hardest," an illustrated brochure by P. G. A. Smith, tells the complete war romance of "Shell." A copy gratis from "Shell" Marketing Co., Ltd., Parker Street, Kingsway, London, W.C.2.

"SHELL" Motor Spirit in the RED CANS now OBTAINABLE EVERYWHERE

THE TRANS-ATLANTIC COMPETITION.

Mr. Hawker's Attempt.

As was stated last week, Mr. Hawker and Lieut.-Commander Mackenzie Grieve left St. John's, Newfoundland, at 12.45 p.m. Greenwich time (3.15 p.m. local time) on May 18th. On the evening of May 19th the Admiralty, with customary innocence, published a communiqué stating that pilot and passenger had been located in the sea at a point 40 miles west of the Shannon. This news was rapidly disproved and nothing further was heard until a message was received on May 23rd from the cable-ship "Faraday," stating that a red light had been seen by the s.s. "Samnanger" in the air at 4.1 a.m. Greenwich time on May 19th. The position given was 50 deg. 28 mins. N. latitude, and 30 deg. 2 mins. W. longitude, or about 1,000 miles from Newfoundland on a direct course to Galway.

Then again silence fell, and hope was abandoned. The stormy weather which prevailed during the middle of the week seemed to leave no chance of the escape of the crew of the Sopwith. It was unlikely that they had been picked up by some passing vessel as Atlantic traffic is not yet congested.

On May 25th, a message was received from Lloyd's signal station at Butt of Lewis stating that the Danish steamer "Mary," New Orleans to Hersens, Denmark, had the Sopwith crew on board in safety. The "Mary" was intercepted by H.M.S. "Woolston," and Comdr. Grieve and Mr. Hawker were taken to Scapa, where they spent the night in H.M.S. "Revenge."

The "Mary" had picked them up in Lat. 50 deg. 20 mins. N., and Longitude 29 deg. 30 mins. W., after they had been in the water one and a half hours. The cause of the failure was a choked radiator filter which caused the water to boil away.

The "Daily Mail" has undertaken to divide £5,000 between them in recognition of the determination in making so risky an attempt under bad weather conditions.

Mr. Hawker and Lieut.-Commander Mackenzie Grieve were received last night at King's Cross with greater enthusiasm than is shown for a great commander or a statesman of world-wide renown.

The following extracts are taken from Mr. Hawker's account in the "Daily Mail" on May 27th :—

"The sky was quite clear for the first four hours, when the visibility became very bad. Heavy cloud banks were encountered, and eventually we flew into a heavy storm with rain-squalls.

"Trouble did not begin until we were five and a half hours out from St. John's. Then the temperature of the water in the radiator began to rise. We could see that something was the matter with the water circulation.

"It was part of my job to watch. Grieve was busy taking sights. It was about 11 p.m. Greenwich (midnight summer time), and the clouds were exceptionally thick. We had not seen the water since we were 10 minutes out from St. John's.

"Our height was about 10,000 feet, and there were many cloud peaks up to 15,000, making a very bad horizon; there being no moon, it not having risen by then, and having to go round the clouds, it was difficult to steer a good course.

"It was freezing hard. The water temperature in the radiator rose from 168 degs. to 176 (212 is boiling point) in a few minutes, and maintained that for a couple of hours or more.

"I came to the conclusion to stop the motor, put the nose of the machine down steeply with the hope that this would clear the refuse in the filter, and this was successful.

"So I decided to go beneath them. Coming down to about 6,000 ft. we found it blacker than ever. Eventually I got to 1,000 ft. above the water before we could see to fly.

"We started on our course again with the sun just getting up, but could not keep the temperature below boiling.

"Then we decided to fly diagonally south-east and then south-west across our course to see if we could find a ship.

"This we did for about two and a half hours before we found a ship.

"At last I sighted a ship close to us on our port (left) bow.

"We flew alongside her at 400 ft., fired three Verey distress signals, and waited some time flying across and across until she got some men up on deck.

"Then we went ahead about two miles and landed in front of her. We made a very good landing, although a very high sea was running, and the machine floated on an even keel well out of the water.

"The sea was running up to 12 ft. and breaking right over the machine and us.

"Our life-saving suits kept us dry, and for an hour and a half we watched the crew of the 'Mary' trying to launch a lifeboat. She was only two hundred yards away. After much difficulty she succeeded in getting to us, and we boarded the lifeboat and were pulled to the ship by a line.

"Owing to the heavy sea, it was impossible to salve anything at all."

The American Attempt.

The N.C.4, Lt.-Comdr. Reid, U.S.N., which alighted at Horta, Fayal, in the Azores after a successful flight from Newfoundland, continued the flight on May 20th. Leaving the harbour at Horta at 12.40 p.m., Greenwich time, she flew without incident to Ponta Delgrada, San Miguel, where she alighted at 3.20 p.m., Greenwich time.

The N.C.3 is definitely withdrawn from the flight in view of the damage caused by her sea journey of 200 miles at the end of the Newfoundland-Azores stage.

The N.C.1 was abandoned at sea after the crew had been rescued, and the N.C.4 is now alone in the flight.

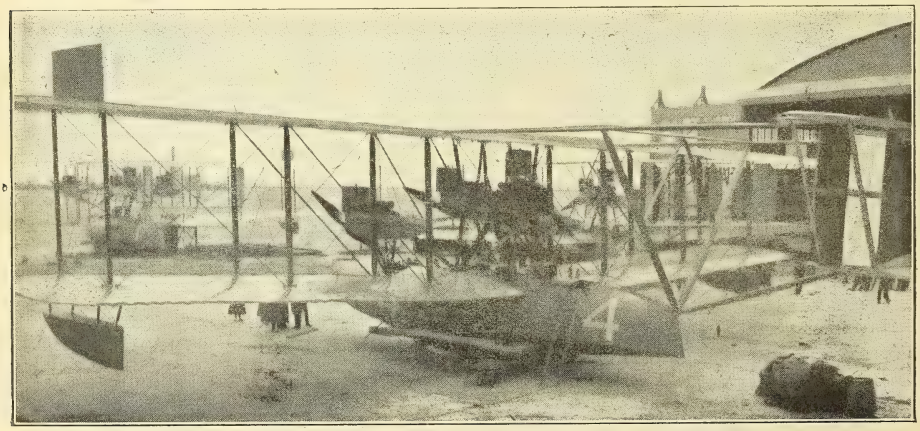
She left the Azores for Lisbon on May 27th.

The Vickers-Vimy and the Martinsyde.

The Vickers-Vimy biplane is expected daily at St. John's. In the meantime the Vickers mechanics are assisting Mr. Raynham and his people in the reconstruction of the Martinsyde biplane, damaged at the attempted start on May 18th.

A new Rolls-Royce engine is being sent to Newfoundland for use in the Martinsyde, and it is expected that the machine will be ready for a fresh attempt in about three weeks.

Capt. Morgan, who was to navigate the Martinsyde, was somewhat more severely injured in the accident on May 18th than was at first understood. One of his eyes has been seriously injured, and he is suffering from shock. Consequently he is now forbidden to fly, and a new navigator has been selected and left England on Monday last.



The N.C.4 (four 400 h.p. Liberty Engines) which flew on May 16th-17th from Newfoundland to Horta, Azores.

THE FAIREY BIPLANE.

It was announced on May 21st that in deference to the wishes of his family Mr. Sidney Pickles had withdrawn from the race, and that a new pilot was being found. The machine is almost ready for transport to Newfoundland. Mr. Fairey says that he is "snowed under" with applications from would-be pilots of the machine.

TRANS-ATLANTIC FLIGHTS.

The following communiqué has been issued by the Government:

It must be understood that these flights are being undertaken as private enterprises and are not in any sense under Government control.

As stated by the Under Secretary of State for Air in the House of Commons on May 8th the attitude of the Air Ministry in regard to the Trans-Atlantic Flight has been to enjoin caution upon those engaged in the enterprise rather than to urge them on to make the attempt.

Even if it were otherwise desirable to assist this enterprise by patrolling the seas with H.M. ships, many and heavy obligations of the Fleet would render this impossible. Although, however, the Government cannot recognise any responsibility in this matter every possible information has been furnished, and every assistance has been given in regard to weather reports, navigation, wireless, and instruments, which could make the venture less hazardous. Throughout, there has been complete co-operation between the Admiralty and the Air Ministry in this matter.

So soon as it was made known some weeks ago that competitors were ready to start, a special officer, known as the Trans-Atlantic Duty Officer, was placed on duty night and day at the Air Ministry. When news was received that Mr. Hawker had started, this Officer instructed the Marconi Company to warn the wireless stations at Poldhu and requested the War Registry at the Admiralty to warn Valentia and Poldhu. This was done. The message was to the effect that all ships should be advised that Mr. Hawker had started. The type of machine, the call sign, and the time of starting were given.

Last night—[the communiqué is undated, but was received on May 22nd.—Ed.]—after consultation between the Under Secretary for the Air and the First Sea Lord orders were issued from the Air Ministry to the Officer Commanding, Royal Air Force Headquarters, Dublin, to get into touch with the Admiral, Queenstown, and place himself under the Admiral's orders with a view to lending assistance by means of aeroplanes in searching for Mr. Hawker, who, it was then supposed, had fallen into the sea off the coast. In accordance with these instructions orders were given for two squadrons of aeroplanes to proceed at once in search of Mr. Hawker. It was impossible for the machines to start last night owing to the rain, a gale, and low clouds. This morning the machines have attempted a search, unfortunately with no result.

In addition to the steps which were taken by the Admiralty on the evening of the 19th, as described to-day in the House of Commons, the Naval authorities have ordered the immediate dispatch of a number of destroyers in further search of Mr. Hawker, though, in view of the vast areas involved, the Admiralty are bound to warn the public that the chances of finding him are very remote.

As regards future flights, the Government, in view of comments as to responsibility in this matter, feel bound to call attention to the many and heavy obligations of the British Fleet. Those responsibilities involve duties in many parts of the world which cannot be set aside. The Admiralty have especial commitments in the Mediterranean, the Black Sea, North Russia, the Red Sea and the Baltic—in which, indeed, there has been fighting within the last few days.

They are also responsible for the vast and continuous mine-sweeping operations. Whilst all these things engage their attention, they are being pressed to find reliefs for men on foreign stations asking for demobilisation, and pressed also to release men everywhere who joined for the period of the war, and any addition to the duties of the Fleet could only be undertaken at the cost of delaying further demobilisation and withholding home-leave from men who have served long periods of War Service on Foreign Stations.

These things being so, whilst the Government is, and has been, most anxious to do everything it can to save such gallant and intrepid airmen as Mr Hawker and Commander Grieve, it feels bound to warn those who may in future make the attempt to fly the Atlantic, that its resources make it utterly impossible that the immense task of patrolling 2,000 miles of the ocean by way of protection can be undertaken.

A VOLUNTEER RESERVE AIR FORCE.

The suggestion made in a letter published in THE AEROPLANE last week regarding the formation of a Voluntary Reserve Force of the R.A.F. has aroused a considerable amount of interest.

In the "Daily News" of May 22nd Capt. M. G. Kiddy (late) R.A.F., wrote:—

A great deal has been heard lately about the wanton destruction of new aeroplanes, and of other machines which are fit to fly. Complaints are also made by young officers of the Royal Air Force that they are being demobilised at short notice after having put in a request to remain in the Service. Many of these youngsters have received no training since leaving school except in flying; and they are desperately keen on making a profession of aviation. But there is no work for them at present as civilian pilots; and they are being demobilised willy-nilly from the R.A.F.

Why should not a Territorial branch of the Royal Air Force be formed? As yet the Air Ministry has done nothing towards the formation either of a Reserve or of a Territorial Force.

The post-bellum R.A.F. will consist of some 2,000 regular officers of all branches—flying, administrative, technical, and medical. The chief qualification for a permanent commission would appear (from questions asked of candidates) to be an unlimited private income. As the Selection Committee has some thousands of applicants to deal with, this may be the best method of choice; but it is very hard on those who are "turned down," yet who desire to continue to fly.

We are told that the future honour, safety, and welfare of this country lie in aerial commerce and protection. This may be accepted as a fact, for the faster aviation develops the quicker do armies and navies become obsolete for war purposes. Granted that this is so, the post-bellum R.A.F. would appear to be quite inadequate for any sudden emergency; and the number of civilian pilots who would be called upon for war purposes will become smaller every year.

The formation of a Territorial branch of the R.A.F. would have many advantages. It would prevent the waste of aeroplanes. Pilots in civilian life would be called up every year and given sufficient flying to keep them proficient. As commercial or civilian aviation develops, trained pilots would be forthcoming to meet its needs. In addition, we should feel that the country was adequately protected by air.

The following letters have been received:—

Dear Sir,—With reference to the recent correspondence on the above-mentioned subject, I most heartily agree with the proposal to form a Territorial Air Force. There can be not the slightest doubt that, some day, they will be called upon to take the field, just as the "Terriers" were on August 5th, 1914.

As a pre-war Territorial ("Pte.") I cannot very well rejoin my old battalion, however much I may desire, because I have since held a commission in the same regiment. However nice it is in fiction for an officer to again serve as a "Pte.," in actual practice it is the reverse of pleasant.

In any case "foot-slogging" has lost its charm, and the old competitions in marching and shooting have lost their one-time attractiveness. Instead, I would rather "sit at ease" in any old 'bus that could fly. Over a year in the flying services has made me lazy, and I do not want any more service in the P.B.I. Bisley calls again this year, but not so loudly as it did to "sweet seventeen" in 1914, and if it were not just to revive old memories, I would not go at all.

But to business. I come from Scotland. Two divisions: (1) Lowland Division; (2) Highland Division, and—two Mounted Brigades. Shall we say two Corps Squadrons, two Scout Squadrons, two Bombing Squadrons, two Patrol Seaplane Squadrons, and some sort of Airship formation.

A JUST GRADUATED BOMBER.

Sir,—I have read with very great interest the letter by "One of the Old R.F.C." on the subject of a voluntary Reserve Force, and am entirely in agreement with his statements.

It is a well-known fact amongst pilots and ex-Service men that there are hundreds simply pining to join a reserve of this kind, but so far no terms to my knowledge have been published by our beloved Air Ministry, and it is certainly not to their advantage to keep silent about the matter, as fellows will realise that they have not flown for months and may lose the original enthusiasm which they had on being demobilised

I for one would be only too glad to help in any way I could, and should like to get in touch with others of a similar frame of mind, if you think we can do anything to move in the matter.

(Signed) NORMAN R. MELVILLE, ex-pilot.

Sir,—With reference to the formation of a Voluntary Reserve Force, I should like to point out that hundreds of pilots have returned to their studies in the Universities and Medical Schools. Graced with a long vacation in the summer, many of them would be very pleased to keep up their flying during that period. Were the Government to start such a Reserve, I am sure they would find a ready nucleus from this source which might prove invaluable in the future. Many students will not have completed their studies for the next three or four years.

"WILLING."

[Any ex-officers who may wish to take a hand in such a scheme as a Volunteer Air Force are welcome to publish their ideas on the subject in this paper.—Ed.]

ART AND THE AEROPLANE

By Captain Wilfrid Gordon Aston, A.F.R.Ae.S., A.M.I.A.E., R.A.F.

I hope I shall not be supposed to be suggesting that THE AEROPLANE is a suitable medium for general Art Criticism in offering these few idle reflections upon this year's Academy, but this is a technical journal which, to say the least, is not as parochial as most of its contemporaries; it is prepared, on occasion, to enlarge its sphere, and it is, to my knowledge, one of the only journals in the world controlled by a born lasher-out, which allows its contributors, on just cause being shown, to lash out likewise.

Possibly, having myself earned a living (save the mark!) with pencil and brush as a so-called artist, though later with a leaning towards making pictorial representation more ancillary to engineering, I am the worst possible Art Critic. That remains to be seen. I shall at least temper justice with mercy —where necessary—but a hard-won knowledge of the technique of oils and water-colour is, I have always thought, essential to fair criticism of paintings. I grant that it has little or nothing to do with Art, but it has a good deal to do with the artifice which gets into an expensive gold (or Dutch metal) frame. A critic ought to be kinder—*must* be kinder, I am sure —if he knows all the distressing circumstances.

The Worst Traditions of British Art.

By way of a general review I would say that the R.A., as usual, upholds the worst traditions of British Art. The walls that knew not Whistler support a great many screamers, shouters, shriekers, and howlers. It is a good thing that the pictures are hung vertically so that the Gods see them foreshortened out of all recognition, otherwise it is fairly certain that Mnemosyne would persuade Jove to raid Burlington House in order to avenge her outraged daughter. Even so, the Gods are evidently after *some* of the exhibitors because they have manifestly, according to their time-honoured custom, rendered them mad. The completion of the job is anxiously awaited.

But none of the artists who have essayed the painting of aeroplanes are mad, most of them are merely silly, and nearly all the rest are just poor practitioners. It is, as I understand it, the business of an artist to observe—until they got into Society, when it is the pleasure of their wives to be observed. Now it is a perfectly extraordinary thing that some quite tolerable artists—I did not say artisans—can observe one thing, but not another. If you were to put an Ionic capital on the top of a Norman column, they could tell you there was something amiss. And if the column were not straight they would very likely suggest that it was Government work.

Charles B. Cochran could see it with his eyes shut, but I merely mention this instance to indicate that artists have eyes, even if they use them in a funny manner. Some of them observe faces and put them on canvas quite acceptably—others legs, others trees.

Some of Mr. B. W. Leader's observations on trees ought to be communicated to the Royal Horticultural Society in a paper entitled "New Species of British Flora." Each cocks his eye at what interests him, and is content to have a hazy idea of the rest of things.

Look at artist's conceptions of motor-cars. They observed motor-cars when these vehicles were unusual. They do not look at them now, otherwise they would not draw such monstrous absurdities as they do. Possibly they draw them better when their attention is drawn to cars, as, for instance, if they are biffed by a W.R.A.F. outside the Bolo, or they marry an heiress.

Artists will have to be made to fly—or given free tickets for the "War in the Air." If they are bad on motor-cars, they are far worse on aeroplanes. They shirk them pitifully. I could could forgive them portraying technical impossibilities—they can't all be Gordon Crosbies or Gordon—— (No. It would be more modest if *you* were to write it in, Mr. Grey. Thank you!) but at least they needn't be wall-eyed. They must know that the fuselage (which, of course, they rhyme with "mucilage") is somewhere in the middle of the planes, generally, and that there are general rough proportions to which all aeroplanes, barring experimental freaks, are answerable. But no! They can't or won't see it. Planes to them are permanent pieces of paint plastered up in the—— (Anybody know a syllabub—I mean synonym—for "sky"? Must begin with a P. I know! Phirmament!) Plastered up in the Phirmament. Planes is the word. Having length and breadth, but no thickness, no solidity, no speed, no kinetics.

Not In but On the Sky.

It is a very sad business. One could, as I say, forgive them for being technically inaccurate—even criminally negligent. After all, what they are after, poor dears, is the general effect; they must not be worried with detail. But they don't even get the general effect. It is common knowledge that aeroplanes fly IN the sky. Artists persist in making them fly ON the sky. This is a distinction with a very big difference. If you wanted to get an artist's aeroplane down, you would not Archie it; you would not even telephone to have a "Snipe" ready. You would wipe it off with a duster or a palette knife.

That is because, robbed of a ground foundation which enables them to suggest perspective in landscape and so forth, artists do not know (or, at any rate, artists who attempt to paint aeroplanes do not know) how to portray the atmosphere. To them a distant machine, a thing almost of vapour in its luminosity, is identically the same phenomenon as a model aeroplane at very close quarters. Many people beat the air, but the air beats artists.

Even Mr. Sargent is guilty. Any R.A.F. court-martial would reduce him to the ranks. He has a notable big picture—foreground, figures, general composition all well up to standard—deserves, if he didn't get, a commission for it—yet upon the sky are lots of aeroplanes literally stuck there. They positively cast a shadow on the paint. They are *not* distant machines; they are very adjacent flies. A tinned salmon would rise to them. Mr. Sargent wouldn't keep a job on Mr. Holt Thomas's advertising staff for a week. Nobody ought to have any use for pictured aeroplanes that you could hang your hat on.

Now in particular.

No. 108. "The German High Seas Fleet, caged in Scapa Flow." By W. L. Wyllie, R.A. *Aviatis personæ*. Very high up and small. The Camel with fuselage badly shrunk by the sun, and two other biplanes of unidentifiable make. One apparently a flying boat. Mr. Wyllie is good on boats. Captain Wyllie, R.A.F., ought to give his uncle a roasting on planes!

No. 144. "Building Flying Boats." By Flora Lion. Figures at work on the bench obviously Bolshevists. No woman can draw a pair of trousers—in paint, I mean. Visit from Colonel Porte or representative of the A.I.D. badly needed at this factory. Hull of flying boat obviously being made of brown paper. Type, presumably, the "Little Kupferburg."

Painted with a Stick of Nougat.

No. 177. "The Channel Patrol. (Nearly said Petrol!) F2A Flying Boat Taking Off." By Captain C. E. Turner. Admirable picture for Mr. Winston Churchill's private office. Technically accurate. So much so that I missed the expected "T5" in the corner. But colouring poorish. Haven't you ever noticed the lighting of the under side of the top wing from the wave-reflections, captain? Well, well, my dear sir, stick 'em *in*. Let's have a bit of motion and light! Why won't artists paint *light?* No picture that looks as if it had been painted with a stick of nougat appeals to me. But this is the best aeroplane in the show. It would fly, anyhow.

No. 241. "London and War-Time." Nocturne. Claude F. Barry. This is of the stipple-impressionist school. St. Pauls, of course, and plenty of searchlights. A very violet sky made up of a regular Morse code of dots and dashes. Aeroplanes very accurately drawn and true to life. There are no aeroplanes visible. But there never were when the searchlights were after them. Pass along, dear; these people want to look at Mr. Hacker's portrait of Sir Alfred Keogh. Six to four they don't know how to pronounce him unless they're relations.

No. 244. "The Avengers." Arthur J. W. Burgess. Portion of angry British Fleet, spirting smoke from its nostrils—funnels I mean—off after the naughty Boche. Led by aeroplane. The picture is as seen from another aeroplane. No suggestion of motion in the composition. Aeroplane apparently hovering—as requisite (see extracts from patent specifications). Aeroplane in foreground decidedly not bad. Another machine in middle distance having a bad time. Am not quite sure which way up it is. Mr. Burgess has probably got the control cables coupled up the wrong way round. It looks as though the pilot would eventually get the hang of it.

No. 261. "Der Tag." (How original!) The German High Seas Fleet coming in to be interned by Admiral Beatty. W. L. Wyllie, R.A. Another job for Captain Wyllie to see to when he's finished with the Irish Sea. Blimp well up, but very shaky and nebulous. Rigging evidently very soggy. Small scout (Camel?) nicely fixed on the sky. Looks as though nothing but turpentine would fetch it down. The sea is very dry in this picture. Looks as though it could be put up in boxes and sold as a polishing powder.

An Aeroplane Nailed on the Canvas.

No. 279. "In soaring he shall rise and on the surface die." Arthur J. W. Burgess. The artist has now got home on a Hun submarine. Cheers. A good vigorous picture. Aeroplane nailed on canvas in one corner. Type, unrecognisable. Presumed to be a scout on the strength of the Manchurian Air Force.

No. 281. "1st Australian Divisional Artillery Going into Action before Ypres, July 1st, 1917." H. Septimus Power. Good old Aussies! But look out! Those three untidy-looking aeroplanes will crash on you. Riggers of same ought to be given the O.B.E. But at least the artist has pushed his aeroplanes an inch or two into the sky. Let us be thankful for small mercies.

(To be continued.)

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NOTES BY THE PUBLISHER.

What are the revelations of Roy? They are the satiric stunts of one who during the war was just an air mechanic. Who he is there are no means of knowing. The Air Force will ask in vain. If the Air Force knows him not, he knows the Air Force, and he indulges in much wit and wisdom at the expense of its past and present chiefs and of those good fellows who, with all their foibles, made it what it is. "The Revelations of Roy," small book though it be, fires a whole drum with a merciless disregard of personality, high or low, and the only person to whom Roy apologises is that great scribe Artemas, whose style he adopts with immense success. Everyone who likes a good laugh at other people's peculiarities and weaknesses will read "The Revelations of Roy," which can be bought for 1s. net.

To pass from "The Revelations of Roy" to "Flying Colours" is very like stepping from the ridiculous to the sublime, from impudence to dignity. "Flying Colours" is by Captain H. M. S. Saundby, M.C., Zepp-strafer and among the most enterprising of the pilots who won for Great Britain the mastery of the air on the Western front. Captain Saundby paints as well as he flies—and, we believe, is by profession an engineer. Anyway, twenty more delightful and realistic pictures in colour we have never seen. They are unique. Major-General Ashmore in an introduction says they give "a true and vivid idea of things as seen by a pilot in action." The book makes the most charming of presents. Every flying boy's mother should possess a copy, as it affords an idea of his work which neither pen nor camera can hope to rival. Everyone interested in the doings of the Royal Air Force in war-time should seize this opportunity for securing a souvenir. An *Edition de luxe*, numbered and limited to 250 copies, is published at £2 2s. net; a Popular Edition at 15s. net.

Aces win battles in the air as well as tricks at the card-table. McCudden was the British ace of trumps, Richthofen the German. The two were examples of nationals at their best. Both wrote their reminiscences and described their methods and their triumphs. Both were sportsmen, and how far ahead British is of German sport will be fully realised by the simple, modest narrative of the one and the thinly veiled sense of superiority of the other. Read both books and you have the heroes of two Empires self-revealed. McCudden's "Five Years in the R.F.C." (7s. 6d. net) and Richthofen's "The Red Air Fighter" (Second Edition, 3s. 6d. net) must have a corner in every properly equipped aeronautical library. No pilot's education is complete unless he has studied both.

Civil and commercial aviation began officially as from May 1st. The problems opened up of costs, of routes, of possibilities of making it profitable are the subject of wide and varied speculation. Captain Arthur Swinton, with a lively sense of the need for careful and authoritative estimates, worked at the subject well in advance, and that his "£ s. d. of Flying" (6s. net) is of considerable practical value is proved by the fact that it commands the interest not only of the aircraft industry and the trader at home, but is in request from the West Indies, Africa, and Australia. It is the book of the moment, though a few years hence it may be looked upon as a prophetic curiosity.

Aeroplane building during the war was a business that had to be learned in a hurry; in peace-time it can be learned as any other business is learned—methodically and deliberately. But nothing can deprive the proved text-book of its usefulness, and Mr. Stepney Blakeney's "How an Aeroplane Is Built" (2nd Edition, 5s. net) may claim to be such a text-book. The secret of its success is easy to explain. Mr. Blakeney is a practical worker himself. He knows what others want to know, and he is able to impart his knowledge simply and effectively. The good mechanic becomes a better by taking a leaf out of Mr. Blakeney's book.

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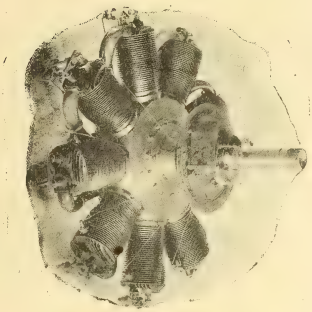
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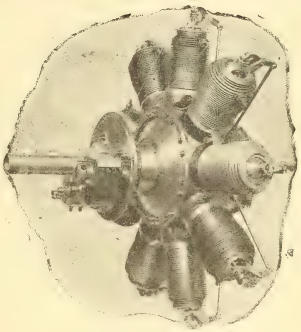
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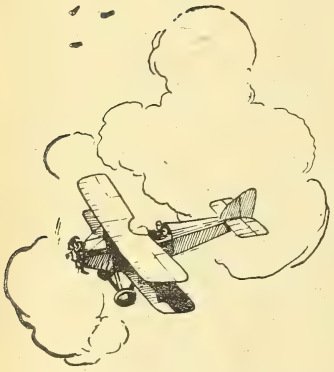
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THE WEEKLY COMMENTARY.

In this week's instalment of his articles on "Commercial Aircraft Design," Capt. Sayers attacks the prevalent ideas as to the average speeds which must be attained if aircraft are to compete with the established forms of transport. The points which he raises are of extreme importance, and may exercise a profound influence upon the future of commercial aviation.

At the same time it seems necessary to point out that he has failed to consider the result of really adverse weather upon slow-speed machines of the type which he appears to advocate.

Whereas a machine capable of a top speed of 120 m.p.h. can maintain an average land speed of 80 m.p.h. against a 40 m.p.h. wind, Capt. Sayers' suggested 60 m.p.h. cruising-speed machines could only maintain 35 m.p.h. against the same wind.

This appears to be a serious, if not a vital, drawback to the use of the low-speed type.

Continuing the series of "Modern British Aircraft," the recent productions of Austin Motors, Ltd., are described.

An article by Mr. C. W. Tinson, F.R.Ae.S., which deals with the Longitudinal Stability of Aeroplanes from the point of view of the practical designer, begins in this issue. The importance of the subject is indubitable, and, so far as is at present known, it has never been dealt with from this point of view.

COMMERCIAL AIRCRAFT DESIGN.—XIII.

SPEED, ITS VALUE AND ITS COST.

By Capt. W. H. Sayers, late R.A.F.

It is thought that the preceding examples will have sufficed to show that there is room for very wide divergences from the present standard methods of design when machines are designed with an eye to the reduction of operating costs when used for some specified commercial purpose.

The whole discussion has so far been confined to types of machine which are well within the limits of size admitted to be practicable to-day.

Even to-day it is possible to build machines of very much larger overall dimensions than those which have been considered in the foregoing articles, and with the development of the art of aircraft design and construction there is no doubt that the limit of possible size will extend enormously.

Aeroplanes are to-day flying at a total weight of 15 tons, and competent designers are planning machines up to four times this weight.

In the design of these machines of the future the considerations which have been briefly touched upon in this series will have even greater applications than heretofore.

But it should be noted that in all that has been so far said, the ideas as to the performance necessary for commercial work which are generally current to-day have been assumed to be correct.

The sketch designs of machines have all been based upon the need for an average schedule speed of 100 m.p.h. or thereabouts.

It is the considered opinion of the author that these ideas are fundamentally erroneous.

Competition with Railways.

It is generally assumed that the aeroplane in commercial work will have to compete with the express train at 60 m.p.h., and that it has no prospect of doing this successfully unless its average schedule speed is at least 100 m.p.h.

At the very outset this neglects two very important facts. In the first place, at the moment 60 m.p.h. is a maximum railway speed for certain very limited services between important centres with a large mutual interchange of traffic, and the average point-to-point railway schedule is much nearer 20 m.p.h., or even lower, if the speed is based on the straight-line distance between two points not in very direct rail connection.

Future Railway Possibilities.

Secondly, the experiments made by the German Government on the Berlin-Zossen Railway, certainly 15 years ago, demonstrated conclusively that rail-borne transit was possible on a standard type of railway track (it was, in fact, a lighter track than that common to British main lines), at speeds up to 120 m.p.h., if electrically propelled trains are employed.

Since it is fairly safe to predict that within 15 years all the main-line railroads of the densely populated parts of the world will be electrified, if there is any large bulk of traffic between particular cities, which demands a speed of 100 m.p.h., the railways will be in a position to handle it at considerably lower running costs than will the aeroplane.

The immediate future of the aeroplane for commercial purposes must depend upon the saving in time which it can effect compared to other forms of transport, or alternatively to the saving in total cost which it will allow over equally rapid forms of transport.

Between two cities, already connected by direct railways, it is now impossible for the aeroplane to save time regularly unless it can maintain an average land speed of 60 m.p.h.—which calls for a maximum air speed of at least 75-80 m.p.h. At this speed it cannot compete with the existing railway in cost.

But in places where the pack mule is the only existing form of transport, an aeroplane with a certain ground

speed of 10 m.p.h. will compete certainly in speed, and very possibly in cost, with the alternative facility.

Average Speeds of To-Day.

Even in a country so well provided with lines of communication as England, there will be found many pairs of important centres, with a quite large mutual interchange of traffic, the most direct railway communications of which are so bad that the average speed of transit between them, taken on the basis of their straight-line distance, is of the order of 10 m.p.h.

The actual volume of traffic is not, in such cases, sufficient to warrant the capital cost of a direct railway line.

An aeroplane capable of 30 m.p.h. in all weathers can here compete with the railway in point of speed, and without the need for the very large capital outlay for which the railway calls.

When the question of overseas transit arises, this aspect becomes much more favourable to the aeroplane. Here the maximum speed of the existing forms of transit drops to a maximum of 25 m.p.h., and an average of under 10 m.p.h., and the regularity and certainty of the services are in some cases almost as greatly dependent on weather as an aerial service would be.

It is therefore worth while to investigate what can be done in the way of designing aeroplanes for efficient operation at low speeds.

Fuel Economy in Aeroplanes.

To secure maximum economy in fuel costs for a given distance flown, a machine should be designed to cruise at the speed corresponding to minimum total resistance.

So far as the wings themselves are concerned, this would occur when the wings are at their best L/D ratio. For the whole machine this will not necessarily be true, since the body resistance is proportional to the square of the air speed, and if, as the speed increases, the body resistance increases at a greater rate than the wing drag, then the least total resistance will be reached before the speed corresponding to the maximum L/D for the wings.

Nevertheless, with any reasonably proportioned machine the lowest total resistance for the whole machine is never reached at any speed very far away from that corresponding to the maximum L/D for the wings.

The average present-day "efficient" aerofoil has a maximum L/D of about 20/1 at a value of the lift coefficient of 0.2 (absolute units). These figures are for full-size wings, not models. The same type of wing will have a maximum lift coefficient of 0.6.

The following table gives the load per square foot, and the wing resistance h.p. per ton total weight, which correspond to various cruising speeds at a value of L/D of 20/1 and of lift = 0.2 and the landing speed for $L_1 = 0.6$.

Cruising Speed.	Load, lbs. sq. ft.	Wing H.P. per ton.	Landing Speed
20 m.p.h.	0.48	6.6	11.5 m.p.h.
40 ,,	2.0	13.2	23.0 ,,
60 ,,	4.32	19.8	34.5 ,,
80 ,,	7.68	26.4	46.0 ,,

It will be noticed that until a cruising speed of considerably over 60 m.p.h. is reached the load per square foot which can be carried is very small, and hence machines designed for these conditions will be of large surface and of high structure weight.

The same "high efficiency" wing at a lift coefficient of 0.4 will have an L/D ratio of 17/1. A high lift wing of the type referred to in previous instalments has at the same lift coefficient of 0.4 roughly the same L/D ration of 17, but with a maximum lift of 0.9.

Working at these figures, the two wings differ only in landing speed, and the conditions corresponding to various cruising speeds become :—

Cruising Speed	Load, lbs. sq. ft.	Wing H.P. per ton.	Landing Speed: Efficient Wing.	Landing Speed: High Lift Wing
20 m.p.h.	0.96	7.8	16.0 m.p.h.	13.0
40 ,,	3.98	15.6	33.0 ,,	26.5
60 ,,	8.64	23.4	49.0 ,,	40.0
80 ,,	15.36	31.2	66.0 ,,	53.0

It will be seen that of these figures those which correspond to 60 m.p.h. cruising speed represent a fair approach to normal practice.

An Actual Machine.

As a matter of fact, some three years ago, the author was responsible for the design and construction of an experimental machine of almost exactly one ton total weight and loaded to 8.6 lbs. per sq. ft. The machine was actually a seaplane, but the figures for the equivalent aeroplane can be deduced with sufficient accuracy by treating the extra weight of the float chassis as an addition to the useful load, and by making a small correction in the body resistance figures. Although this design could now be improved upon, it is sufficiently near to modern practice to use as a fair standard of comparison.

As an aeroplane designed for war service, this "standard" machine was fitted with an engine of 150 h.p. The power plant weight, including water and radiators, was 450 lbs., the aeroplane structure weight 930 lbs., which with pilot (180 lbs.) totals 1,560 lbs., leaving 680 lbs. as disposable load, including fuel.

At full power the level speed was 105 m.p.h., and the most economical cruising speed in still air was about 90 m.p.h., in spite of the fact that the speed for minimum resistance was 56 m.p.h.

This was because the fuel consumption of the engine did not fall anything like so rapidly as the power when the throttle was closed beyond very narrow limits. In addition, at full power the engine could not be relied on for any time. At 90 m.p.h. it would run indefinitely, and as a commercial machine it would have been unsafe to open the engine out further.

It may therefore be considered that the maximum safe air speed of this machine for any reasonable length of journey was 90 m.p.h., corresponding to an average schedule speed of 75 m.p.h., allowing for adverse weather conditions.

At this speed the weight of fuel required for a 250-mile journey was roughly 280 lbs. This allows for an average land speed of 75 miles an hour at an air speed of 90—*i.e.*, for an average adverse wind of 15 m.p.h.

The paying cargo capacity was therefore 400 lbs.

And a Practicable Modification.

Let this identical aeroplane be modified for an average schedule speed of 60 m.p.h. At 60 m.p.h. air speed the wing resistance h.p. will be 23.4, and the body resistance h.p. will be 9.6—a total propeller h.p. of 33 for horizontal flight. As a reserve and to give a minimum climb of 300 ft. per minute an extra 21 h.p. is required, or 54 airscrew h.p. total. Allowing 75 per cent. airscrew efficiency, this is 72 b.h.p. at the engine.

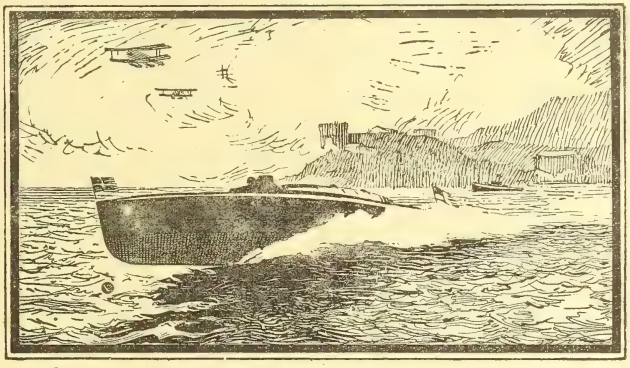
With this power the machine could actually attain a maximum level speed of 78 m.p.h., which gives a speed margin for adverse weather of 18 m.p.h.

As the full load weight is to remain at 1 ton, the aeroplane structure weight will be the same, and the factor of safety is unaltered. A slight saving in weight in engine supports may be neglected.

An engine giving 75 b.h.p. reliably and economically could be installed for a total weight of 275 lbs. This allows for a more robust type of engine than that used in the "standard" machine. The fuel consumption for a 250-mile journey at 60 m.p.h. land speed, but at 75 m.p.h. air speed (*id est*, against a 15-mile wind), would be 150 lbs.

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The weight without cargo is then 930 lbs. (aeroplane) + 275 lbs. (engine) + 150 lbs. (fuel) + 180 lbs. (pilot) = 1,535 lbs., giving 705 lbs. as paying cargo capacity.

It is difficult to estimate the relative prime cost of these two machines, but in the "standard" form, if the cost of the aeroplane alone is taken as unity, the cost of the engine would now be about 2—*i.e.*, the total cost would be roughly 3 times that of the aeroplane without engine. At present-day prices, roughly the original machine would have cost £1,200.

The cost of the 60 m.p.h. machine would remain unaltered so far as the aeroplane itself is concerned, and the price of the engine would be halved; *i.e.*, the whole machine would cost two-thirds of the "standard" one, or £800.

A little consideration will show that it would be useless to attempt to reduce the economic cruising speed of this machine to 40 m.p.h. The loading corresponding to 40 m.p.h. at lift coefficient = 0.4 is just under 4 lbs. per sq. ft.

For the machine considered above the full load weight would reduce to about 1,000 lbs. The structure weight would be smaller because of the lighter loading, but it would not be less than 470 lbs. Roughly a 35 h.p. engine weighing about 120 lbs. and requiring 120 lbs. of fuel for 250 miles would have to be carried.

Adding to this 180 lbs. for pilot, we have a total weight, without cargo, of 890 lbs., leaving only 110 lbs. for available cargo.

If the surface is increased, the 40 m.p.h. machine makes a better showing. For a total weight of 1 ton, the machine structure weight would be nearly 1,400 lbs. Allowing for an initial angle of climb equal to that allowed in the 60 m.p.h. machine, and roughly the same margin of speed, 52 b.h.p. would be necessary.

The power plant weight might reduce to 200 lbs., and fuel for 250 miles to 130 lbs. With pilot the weight would be 1,900 lbs., leaving 340 lbs. available for cargo.

The prime costs of this machine would be greater than that of the 60 m.p.h. machine, and the fuel consumption per ton-mile would be increased 50 per cent.

Thus so very light a loading would be unprofitable.

(To be continued.)

THE AVRO-GREEN "BABY" SPORTING BIPLANE.

It is now possible to describe and illustrate this interesting machine in some detail.

As will be seen from the illustrations, its lines follow the very latest practice and the machine has proved herself on test to be very highly efficient, controllable and stable. The general design and construction follow closely the Standard Avro practice and the same care has been expended on this machine as in all the productions of A. V. Roe and Co., Ltd.

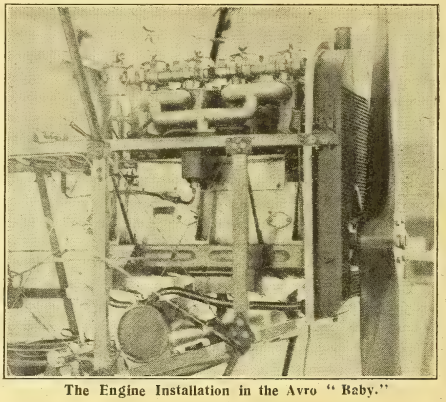
The following table gives the main particulars:—

SPECIFICATION.

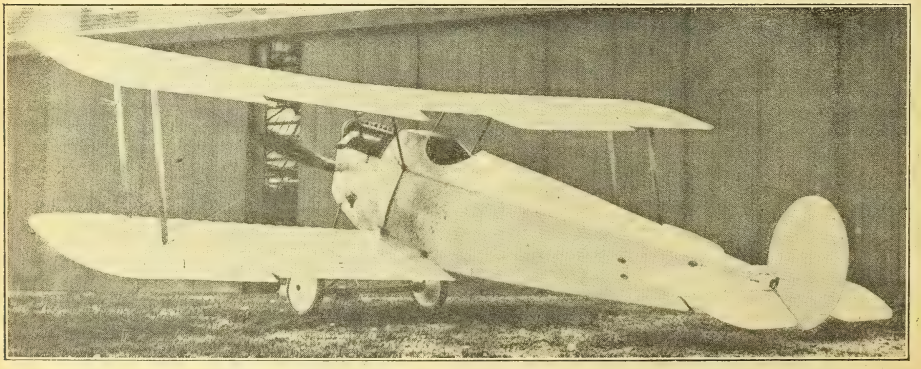
Span of top wings	25 feet.
Span of bottom wings	25 feet.
Chord of wings	4 feet.
Gap	4 ft. 6 in.
Length overall	17 feet.
Height overall	7 ft. 6 in.
Span of tail plane	7 ft. 6 in.
Chord of tail and elevators	3 ft. 3 in.
Area of wings and ailerons	180 sq ft.
Area of tail and elevators	21 sq. ft.
Dihedral top and bottom wings	3 deg.
Weight, bare (with water)	625 lbs.
Weight, loaded	857 lbs.
Surface, loading	4.75 lb. per sq. ft.
Engine loading (40-h.p.)	21.4 lb. per h.p.

POWER PLANT.

The engine is a 4-cylinder water-cooled 35-40-h.p. "Green" Everyone connected with aviation will remember the large amount of work which this little engine performed in the early days of aviation and it is interesting to note that the identical engine used in the new experimental model is twelve years old and was

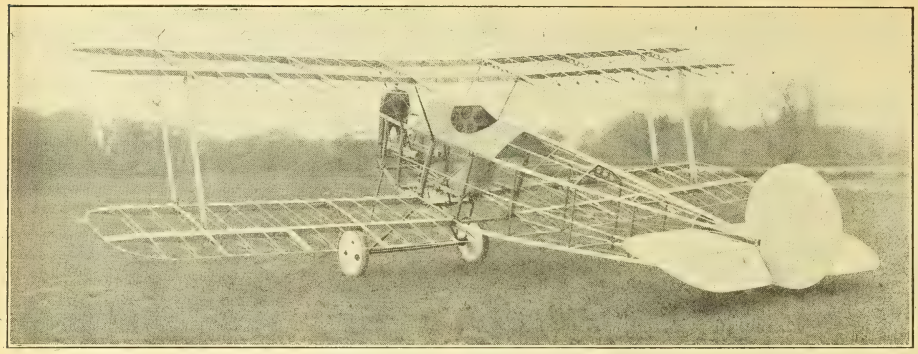


The Engine Installation in the Avro "Baby."



Three-quarter View from Rear, the Avro "Baby" (35 E.p. Green Engine).


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Skeleton Erection of the Avro "Baby."

used by Captain Fixton in the early Avro biplane at Brooklands in 1912. The engine has been considerably improved by the Green Co., and has been fitted with aluminium pistons, new type cam-shaft valves and valve cages, and with an ingenious oil pressure regulator which controls the amount of oil used by the engine according to the throttle opening. The engine has been found to run very smoothly and without vibration, and although a considerable amount of flying and testing has been already carried out with this machine, no adjustments have been necessary to the engine since it was installed in the plane. Although this particular engine is somewhat heavy for its horse-power, the production engines will be lighter and A. V. Roe and Co., Ltd., are of the opinion that the slightly extra weight of this type is more than compensated by its extreme reliability and economy.

PERFORMANCE.

The machine is at present undergoing its final performance tests, but on a preliminary test it gave the following results, which will be improved upon :—

Maximum speed.....78 m.p.h. (near the ground).
Landing speed .....32 m.p.h.
Stalling speed .....36 m.p.h.
Climb to 1,000 ft. .....1 min. 40 secs.
Climb to 2,000 ft. .....4 min.
Climb to 3,000 ft. .....6 min.

Later tests show that the machine climbs 10,000 feet in 24 mins., and is then still far from its ceiling.

From this it will be seen that the machine is very efficient indeed, and, as it only requires a very short run before leaving the ground, it is quite capable of landing in and rising from small fields even when surrounded by trees. The controllability of the machine is extraordinary, and it has been looped, rolled, spun, and stalled. Its small size and robust construction make it particularly suitable for stunting, although it is primarily intended to be stable and easy to fly, and has shown itself capable of flying perfectly without any control on the part of the pilot.

Although the maximum revolutions of the engine are 1,500, the machine will fly for an indefinite period at only 750 r.p.m., at which speed the petrol consumption is extremely low.

The price has been provisionally fixed at £475 and thus the machine will come within the range of a vast number of sportsmen who are desirous of taking up flying or of demobilised officers (R.A.F.) who are anxious to continue flying

COSMOS ENGINE TESTS.

The Cosmos Engineering Co.'s new 450-h.p. "Jupiter" engine, which was described in The Aeroplane on January 29th, 1919, has now been subjected to official tests by the Technical Department, R.A.F.

It is understood that extremely satisfactory results were obtained. At the normal speed of 1,800 r.p.m. the weight per B.H.P was found to be 1.42 lbs., and the fuel consumption 0.565 pints, roughly, 0.53 lbs. per B.H.P. hour.

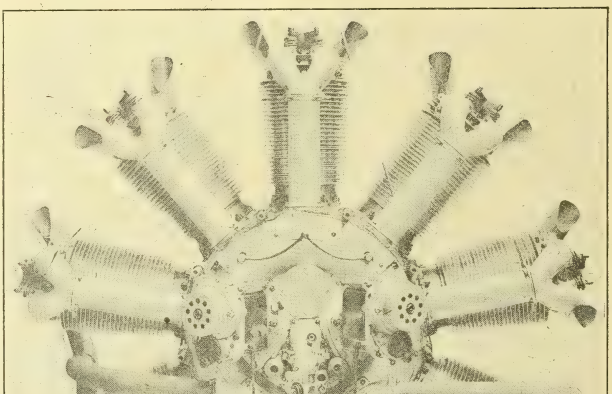
This fuel consumption compares favourably with that of the best of water-cooled engines, and, in conjunction with the very low weight per horse-power, puts the "Jupiter" engine into the very front rank of light power-plants.

Official test figures for the Bristol "Type F" single-seater fighter fitted with the Cosmos "Mercury" engine of 315 h.p. have also been issued.

These show that the machine climbed to 10,000 feet in 5 mins. 25 secs., to 20,000 in 16 mins. 15 secs., and had a level speed of 143 m.p.h. at 10,000 feet.

An illustration of this machine will be found on page 2157.

It must be remembered that this machine was originally designed for and fitted with a rotary engine of much lower power, and the illustration shows how the "Mercury" takes the place of the lower-powered engine without spoiling the lines of the fuselage. As a matter of fact the outside diameter of the "Mercury" engine is practically the same as that of the standard types of rotary engine of 100 to 150 h.p., and its total weight is very little greater than that of the 150 h.p. rotary.



The Cosmos Engineering Co.'s 450 h.p. "Jupiter" Engine.

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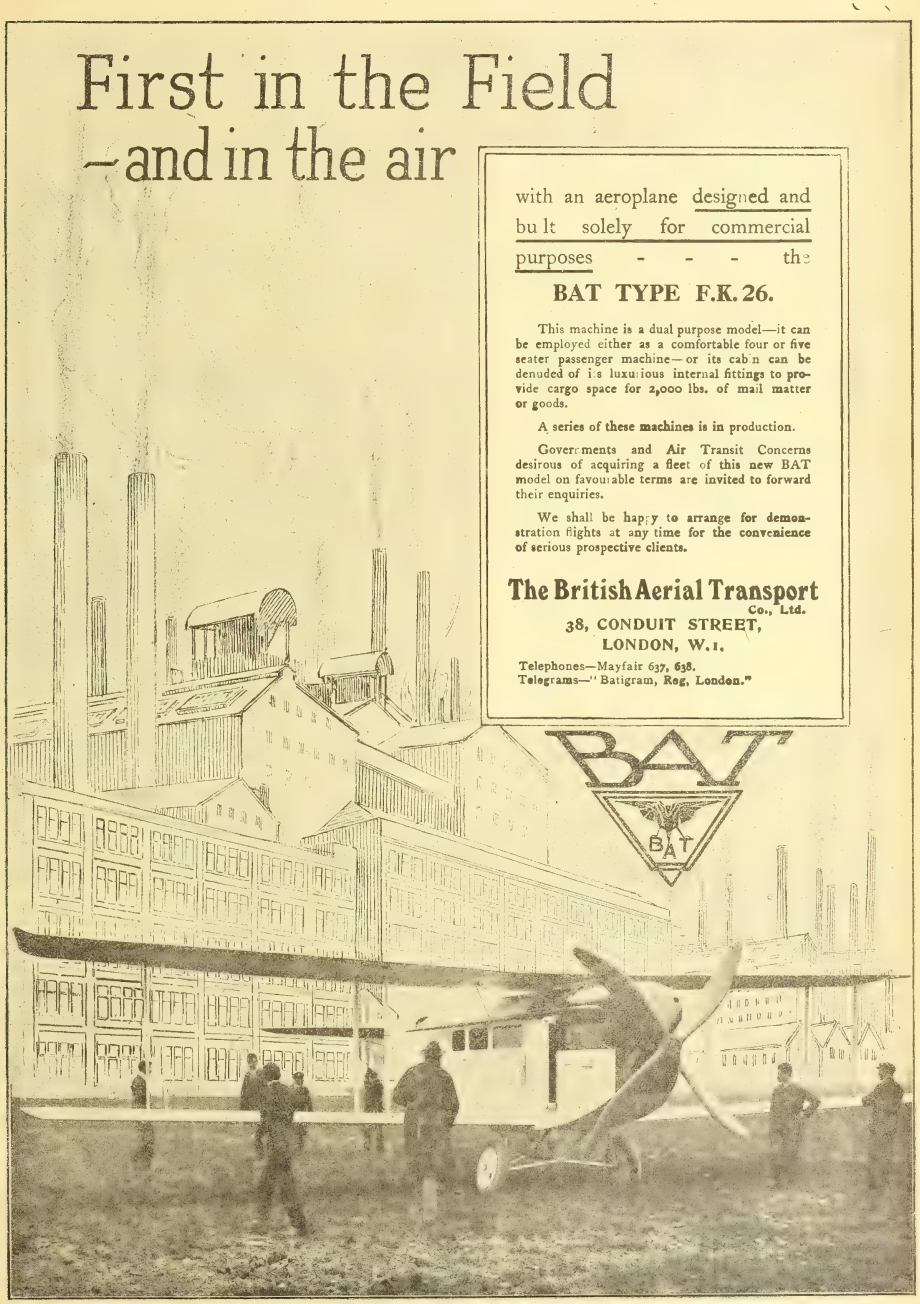
A series of these machines is in production.

Governments and Air Transit Concerns desirous of acquiring a fleet of this new BAT model on favourable terms are invited to forward their enquiries.

We shall be happy to arrange for demonstration flights at any time for the convenience of serious prospective clients.

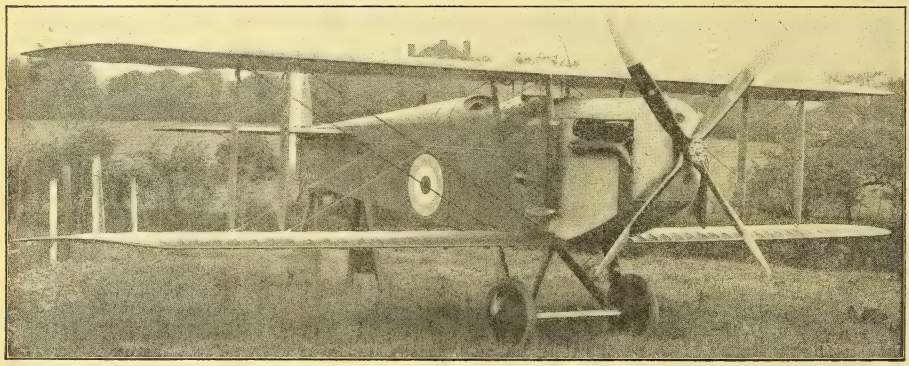
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BAT



MODERN BRITISH AEROPLANES.

IV.—Austin Motors, Ltd.



Three-quarter Front View of the Austin "Ball" Fighter (200-h.p. Suiza).

The makers of the well-known Austin motor-car began the manufacture of aircraft under war conditions, and produced large numbers of machines to Government specifications.

In 1917 they turned their attention to the manufacture of machines to their own designs, the more important of which are here described and illustrated.

AUSTIN "BALL" SINGLE-SEATER BIPLANE.

The Austin "Ball" biplane was designed as a single-seater fighting scout to the ideas of the late Captain Ball, V.C., D.S.O., M.C. The fuselage is very deep, reaching almost to the top plane and carries in its nose a 200-h.p. Hispano-Suiza engine, which is well cowled in. The radiators are fixed on the side of the fuselage below the front centre section struts.

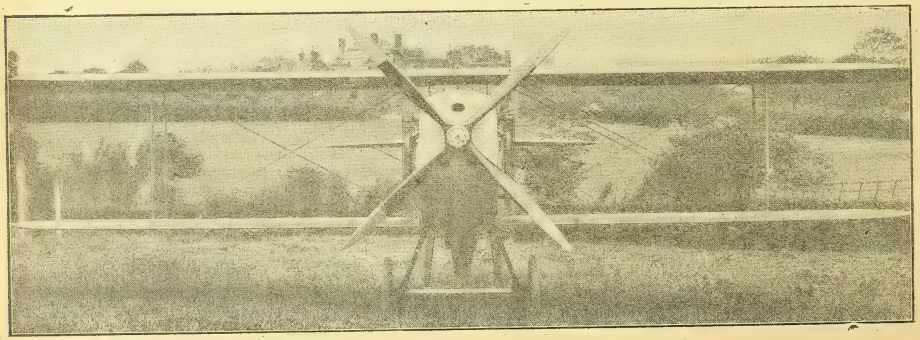
The planes are unstaggered and of equal span, having one pair of struts on either side of the fuselage. The tail unit is of standard type except that there is no fixed fin area. The undercarriage is of the Vee-type, the axle and wheels being slung at the apex of the Vee with rubber shock-absorbers.

SPECIFICATION

Type of machine	Single-seater Biplane, Scout Fighter.
Name or type No. of machine	Austin "Ball."
Purpose for which intended	Scouting and Fighting.
Span	30 ft.
Gap	4 ft. 9 in.
Overall length	21 ft. 6 in.
Maximum height	9 ft. 3 in.
Chord	5 ft.
Total surface of wings	290 sq. ft.
Span of tail	11 ft. 3 in. (over elevators).
Total area of tail	32 sq. ft. (includes elevators).
Area of elevators	8 sq. ft. each.
Area of rudder	8 sq. ft.
Area of ailerons	7½ sq. ft. each.
Total area of ailerons	30 sq. ft.
Engine type and h.p.	200-h.p. Hispano-Suiza "V" type, water-cooled.
Weight of machine empty	1,426 lbs
Load per sq. ft.	7 lbs.
Weight per h.p.	9.25 lbs.
Tank capacity in hours	2 hours.
Tank capacity in gallons	Petrol 31½ galls., oil 5 galls., water 9 galls.
Performance—	
Speed low down	138 m.p.h.
Speed at 10,000 feet	126 m.p.h.
Climb—	
To 10,000 feet	10 minutes.
Total weight of machine loaded	2,075 lbs.

THE AUSTIN "GREYHOUND."

The Austin "Greyhound" represents one of the latest efforts to produce a fast, quick-climbing two-seater fighting and reconnaissance biplane. In general arrangement it follows standard practice. The fuselage carries in its nose a 320-h.p. ABC "Dragonfly" engine. A conical cowling covers the engine in with the exception of the cylinder heads, the shape of the cowling being preserved throughout the length of the fuselage by fairing. There is almost equal fin area above and below the fuselage. The upper main plane trailing edge is cut away and the lower plane is of less chord than the upper, thereby giving the pilot a good view.

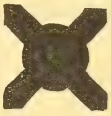
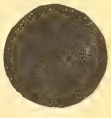


Front View of the Austin "Ball" Fighter (200-h.p. Hispano-Suiza).

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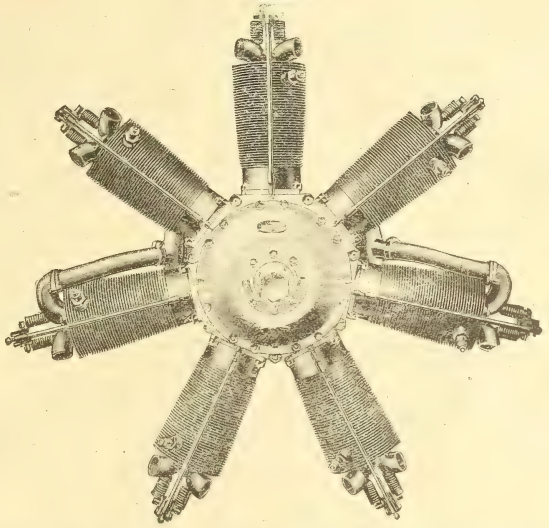
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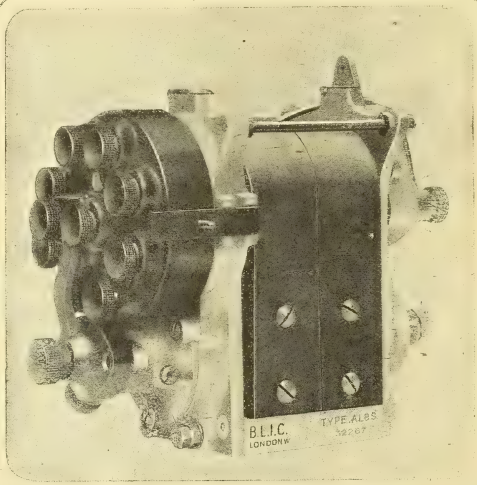
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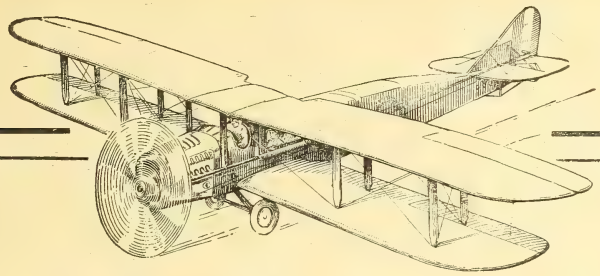
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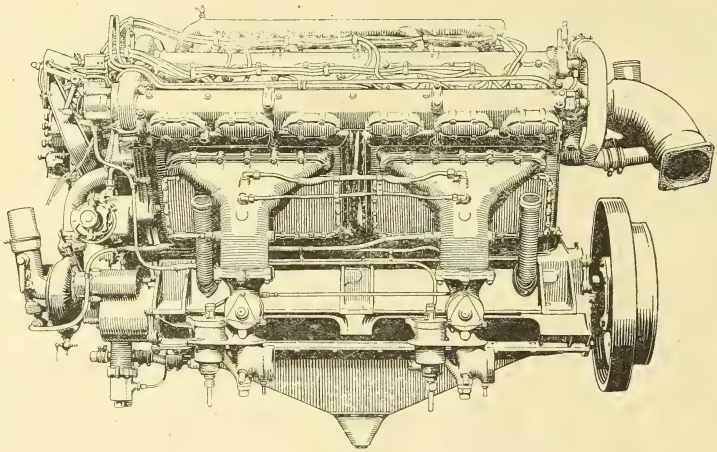
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W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicoto Fen, London. Avenue 7854 (2 lines.)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 430.
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asteroidal, Coventry." Coventry 278.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 999 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—
Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London." Museum 70.
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros, Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." 4033-4034-4035.
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1 "Imbrowned, Bethroad, London."
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham." Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115.

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Mann, Egerton & Co., Ltd., 379/383, Euston Road, London, N.W.1. "Manegers, Euston, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—
C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London" Central 11305 & 13466.

Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)
C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.
Integral Propeller Co., Ltd., "Aviprop, Hyde, London." Hendon 9. Kingsbury 104
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 20

Rawhide Hammers—
Ira Stephens, Whitelands Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 & 3812.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10 "Rodynalite, Phone, London." Willesden 2480

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830
British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).



The Aeroplane Buyers' Guide

Accumulators—
The Chloride Electrical Storage Co., Ltd., Clifton Junction, near Manchester. "Chloride, Pendlebury." Central Manchester, 1065 Pendleton, 11.

Acetylene Welding Plant—
Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Vic. 3540 (3 lines)

Aeroplane Manufacturers—
Aircraft Manufacturing Co., Ltd., Hendon "Airmanship, Hyde, London" Kingsbury 229
Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne" Gosforth 500
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (4 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich" Norwich 851.
British Aerial Transport Co., Ltd. Head Office: 38, Conduit Street, London, W.1. "Balgatran, Rec, London" Mayfair 937, 608.
Works: Hythe Road, Willesden, London, N.W.10. "Aerbritans, Phone, London" Willesden 2272, 2273
British & Colonial Aeroplane Co., Ltd (The Bristol Co.), Filton, Bristol. "Aviation, Bristol" Bristol 3009.
British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London" Hampstead 5551
Central Aircraft Co., High Road, Kilburn, N.W.6. "Avichuton, Phone, London" Hampstead 3303 and 4424.
Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne" Central 3021 (2 lines).
Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne" Eastbourne 1376.
Gosport Aircraft Co., Gosport. "Flight Gosport" Gosport 217
Graham-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London" Kingsbury 120.
London Office, 12, Regent Street, S.W.1. Regent 2684.
Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophil, Crickle, London" Hampstead 7420
Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St. James, London" Regent 612
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 482 (4 lines).
Martinsyde, Ltd., Brooklands, Byfleet, "Martinsyde, Weybridge" Woking 331; Byfleet 171
"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London." Willesden 2455
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford" Bradford 5700 (4 lines)
The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodies, London." Putney 2240-2241
Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester" City 8535-8541, Manchester.
Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 103.
Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tractor, Phone, London." Regent 378.
The Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton" Wolverhampton 054.
The Sidddeley-Deasy Motor Car Co., Ltd., Coventry. "Deasy, Coventry" Coventry 954
Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston" Kingston 468 (3 lines).
The Supermarine Aviation Works, Ltd., Southampton. "Supermarin" Woolston 37 (2 lines).
Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet" Byfleet 1, 2 & 3.
Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyld, Knights, London" Kensington 6800
Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London" Museum 3000.
Westland Aircraft, Yeovil. "Aircraft, Yeovil" Yeovil 129
White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3

Airships—
Airships, Ltd., High Street, Merton Wimbledon 1314.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Webs, Edinburgh." Edinburgh 3880 Central. (5 lines)
Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tractor, Phone, London." Regent 378.
C. G. Spencer and Sons, Ltd. (See under "Balloons").

Aluminium Castings (Sand and Die)
Coan, R. W., 210, Goswell Road, London, E.C.1. "Krankases, Isling, London" City 3846.

Balloons—
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Webs, Edinburgh." Edinburgh 3880 Central. (5 lines)
C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronaut, London." Dalston 1893.

Bent Timber Parts—
Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London" Museum 460. Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 15.

Bearings (Etonia Cast Phosphor Bronze)
Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds" Central 3927

Blowpipes (Oxy-Acetylene)—
Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London" Vic. 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London" Vic. 3540 (3 lines)

Bolts—
Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16. Dalston 2500 (2 lines).

Books (Aero Engines)—
Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2

Buildings—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich" Norwich 851.
Rubery Owen & Co., Darlaston, South Staffs

Cable Coverings and Cable Controls—
The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green" Acock's Green 104 & 104
Bowden Wire, Ltd., Willesden Junction, "Bowirchm, Harles, London." Willesden 2405 (3 lines).
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61.

Carburettors—
Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4070

Casein—
Nieuwhof, Suric & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricoloon, Fen, London" Avenue 34 and 35

Clothing—
Burberry's, Ltd., Haymarket, S.W.1 Regent 2165
Dunhill's, Ltd., Euston Road, N.W.1 "Dunsend, London" North 5406
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Webs, Edinburgh." Edinburgh 3880 Central. (5 lines)

Component Parts—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).
Brown Bros., Ltd., Gt. Eastern St., E.C.1
Central Aircraft Co., High Road, Kilburn, N.W.6. "Avichuton, Phone, London." Hampstead 3303 and 4424.
P.D.V. Aircraft Co., Ltd., Princes Street, Richmond. "Avros, Richmond" Richmond 1081
Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston" Bilston 10.

Cords, Tapes, and Threads—
MacLennan, J., & Co., 30, Newgate Street, E.C.1. "And at Glasgow. City 3115.

Dopes—
Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafree, Piccy, London" Gerrard 5312
British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London" Regent 5040
The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London" Gerrard 2[illegible]
Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London" Gerrard 430
Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Olcotine, Strat, London." East 955

Engines and Parts—
Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1
Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries" Dumfries 281-282
Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London" Gerrard 258
The Cosmos Engineering Co., Ltd., Fishponds, Bristol City 1506
Dudbridge Iron Works, Ltd. (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London" Vic 7068
Gordon, Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge" Weybridge 550 (7 lines).
Green Engine Co., Ltd., Twickenham Richmond 1203
Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith" Hammersmith 3040
Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London" Gerrard 8078
Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1. "Rollicat, London." Gerrard 1634-36
The Siddeley-Deasy Motor Car Co., Ltd., Coventry. "Deasy, Coventry" Coventry 954
Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton" Wolverhampton 054.
The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Eleven-fold, London" Walthamstow 821 (2 lines).
Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames" Walton-on-Thames 220

Electrical Accessories—
Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton" Tottenham 1024
Brown Bros., Ltd., Gt. Eastern St., E.C.1
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London" Central 2207; London Wall 1304
Mann, Egerton & Co., Ltd., 147, Cleveland Street, London, W.1. "Installing, Euston Road, London" Museum 70
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London" Willesden 2400

Electric Cables—
E. Kalker and Co., Coventry. "Kalker, Coventry" Coventry 258
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London" Central 2207; London Wall 1304

Electric Lighting and Power—
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London" Central 2207; London Wall 1304
Mann, Egerton & Co., Ltd., 147, Cleveland Street, London, W. "Installing, Euston Road." Museum 70 (4 lines)

Electro Platers and Metal Polishers' Engineers—
W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham" Birmingham 3622 Central (3 lines)

Flare Lights—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London" Victoria 3540 (3 lines)

Flexible Shafts—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61.

Fluxes—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London" Victoria 3540 (3 lines)
The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng

Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport" Gosport 217

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich" Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall" Walsall 0126

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham" East 407

Glue—
Cannon, B., & Co., Ltd., Lincoln. London Office, 120, Cannon Street, E.C.4. "Beecolin, Cannon, London" City 1506
Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid.) "Excreaden, Phone, London" Avenue 3041-2
Mouline Co., 8, Arthur Street, E.C. Bank 5871

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London" Regent 1340

Heating and Ventilating—
Chas. P. Kinnell and Co., Ltd., 65 & 651, Southwark Street, London, S.E.1. "Kinnell, London" Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London" Hop 705

Instruments—
Butch Wright Co., Ltd., 15, Chancery Lane, W.C.2 Holborn 1598

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Amerod, Phone, London" Walthamstow 170

Insurance—
Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 6034
Bray, Cobb & Co., Ltd., 109, Piccadilly, W.1.
S. Sackville & Sons, Duchy Chambers, 4, Clarence Street, Manchester
Harold Townend, Ltd., 13-14, Aldwych Lane, King William Street, E.C.4. "Caritaur, London." Central 156 (2 lines).
Percy Wingfield, 22, Newgate Street, E.C.1 City 4072

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London. "Pegamoid, Cent, London" City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—
W. B. Dick & Co., Ltd., 60, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London Avenue 7851 (2 lines)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 264, Tottenham Court Road, W.1. "Vicksmag, Phone, London" Museum 430
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asgrandal, Coventry" Coventry 278.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham" Central 909 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432

Metals in General—
Samuel Mercer & Co., 168, Upper Thames Street, E.C.4. "Reconciled, Cannon, London" City 6342

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury" Oldbury 111 (4 lines)
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. "Bolts and Nuts" "Bayliss, Wolverhampton" Wolverhampton 1041
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (5 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 147, Cleveland Street, London, W.1. "Installing, Euston Road, London" Museum 70
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvopull, Phone, London" Holborn 410
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsdon, Phone, London" Regent 1181
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London" Willesden 2400.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston" Bilston 10

Metric Bolts—
Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 415
Rubery Owen & Co., Darlaston, South Staffs

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast" Belfast 3403-3404-3405
British Metal (Kingston), Ltd., Kingston-on-Thames
Brown Bros., Ltd., Great Eastern Street, E.C.1. "Inbrownad, Bethrood, London" London Wall 6600
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham" Central 795.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Thread. City 3115

Motor Cars—
Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries" Dumfries 281-282
Mann, Egerton & Co., Ltd., 147-151, Euston Road, London, N.W.1. "Manegeran, Eusroad, London" Museum 70
Standard Motor Car Co., Coventry. "Flywheel, Coventry" Coventry 550 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing"

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340

Oils—
C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London" Central 12305 & 13466

Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London" London Wall 3206-3207.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Webs, Edinburgh." Edinburgh 3880 Central. (5 lines)
C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2449

Presswork—
Rubery Owen & Co., Darlaston, South Staffs
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (4 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich" Norwich 851.
Elbora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Elbora, Kingston" Kingston 972.
Integral Propeller Co., Ltd., "Avipros, Hyde, London" Hendon 6 Kingsbury 104
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge" Weybridge 526-527.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds" Leeds 20547-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil" Yeovil 129

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 29

Rawhide Hammers—
Ira Stephens, Whiteladies Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton." Ashton 709

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield" Wakefield 166

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Eling, London" City 5811 & 5812
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Webs, Edinburgh." Edinburgh 3880 Central. (5 lines)

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester" City 1115.

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall" Walsall 0126

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch" Redditch 74

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (5 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 482 (4 lines)
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford" Bradford 5700 (4 lines).
Short Bros., Rochester. "Seaplanes, Rochester" Chatham 627
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton" Woolston 37
Westland Aircraft, Yeovil. "Aircraft, Yeovil" Yeovil 129

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London" Vic. 3540 Victoria (3 lines)
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London" Willesden 2400

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (4 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London" Vic 4830
British Metal (Kingston), Ltd., Kingston-on-Thames. (Staffs
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsdo, Phone, London" Regent 1181
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London" Victoria 3540 (3 lines)

"The Aeroplane" Buyers' Guide.—*continued.*

Solder Manufacturers—

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Sparking Plugs—

Brown Bros., Ltd., Great Eastern St., E.C.1. Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 255.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 6/10, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Robinhood Engineering Works, Ltd., 5, Newlands, Putney Vale, S.W.15. Makers of KLG Plugs. "Raclgec, Phone, London." Putney 2132-3.

Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines)

Steel—

Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield." Central 4522-5-4.

Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Tapes and Smallwares—

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.
C. E. Matthews & Co., Ltd., Castle Works, Bermondsey Square, S.E.1. "Webbance, Berm, London." Hop 4058.

Timber—

Hoptoni & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London." Museum 490. Also at Market Harborough, Leicestershire. "Höptons, Market Harborough." Market Harborough 15.

Time Recorders—

Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—

Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349

Turnbuckles—

Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery Owen & Co., Darlaston, South Staffs. Central 3880 (5 lines).
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston." Museum 70 (4 lines).

Tyres and Wheels—

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Webs, Edinburgh." Central 3880 (5 lines).
The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyrecord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Varnishes—

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjap, Phone, London." Mayfair 6547 (5 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61

Welding and Cutting Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 3830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Welding Repairs—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac," Phone, London." Victoria 3540 (3 lines).

Wind Shields—

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The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2280.
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

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Wire and Cables—

Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

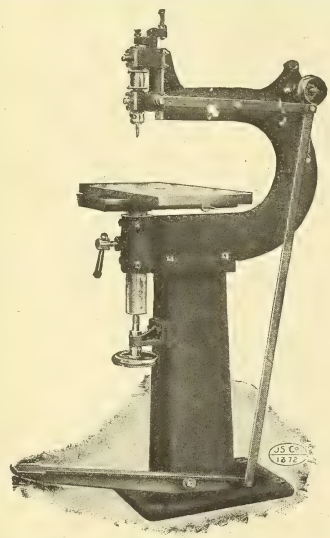
Wirework—

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61

Woodworking Machinery—

Robinson, Thomas, & Son, Ltd., Rochdale. "Robinson, Rochdale." Rochdale 467.
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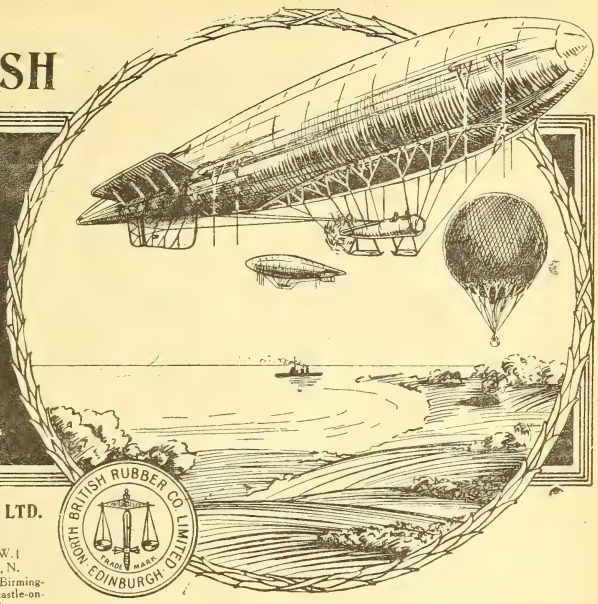
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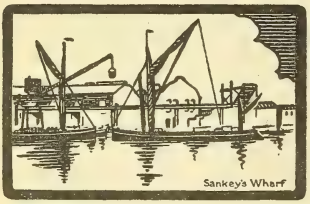
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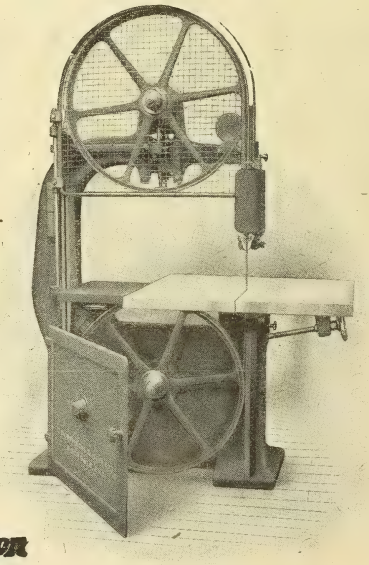
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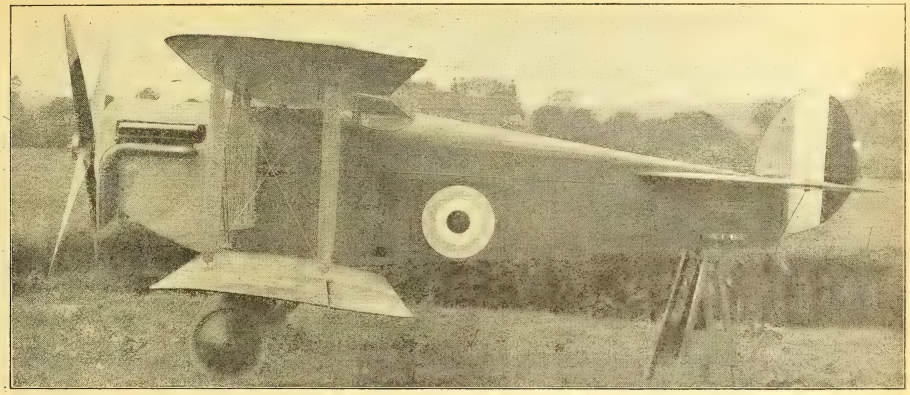
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Side View of the Austin "Ball" Single-seater Fighter (200-h.p. Hispano-Suiza Engine).

Provision is made for the machine to carry three guns, camera, wireless, oxygen apparatus, and heating apparatus.

SPECIFICATION.

Type of machine	Two-seater Fighter, Reconnaissance Biplane.
Name or type No. of machine	"Greyhound."
Purpose for which intended	Fighting and Reconnaissance.
Engine type and h.p.	A.B.C. "Dragonfly," 320 h.p.
Span	Top plane, 39 ft.; bottom plane, 36 ft. 7 in.
Gap	4 ft. 11¼ in.
Maximum height	10 ft. 4 in.
Chord	Top plane, 6 ft. 4.8 in.; bottom plane, 4 ft. 3 in.
Total surface of wings	400 sq ft.
Span of tail	12 ft. 9.5 in.
Total area of tail	47 sq. ft.
Total area of elevators	19.8 sq. ft.
Area of rudder	9.9 sq. ft.
Area of fin	Top, 2.76 sq. ft.; bottom, 2.3 sq. ft.
Area of each aileron and total area	Two top, 14.8 sq. ft.; two bottom, 7.8 sq. ft.; total, 45.2 sq. ft.
Weight of machine empty	2,050 lbs.
Load per sq. ft.	7.72 lbs. per sq. ft.
Weight per h.p.	10.3 lbs.
Tank capacity in hours	3 hours.
Tank capacity in gallons	Petrol 66 galls., oil 8 galls.
Weight of machine fully loaded	3,090 lbs. (including guns, ammunition, etc.).
PERFORMANCE (estimated)—	
Speed at 10,000 feet	130 m.p.h.
Landing speed	45 m.p.h.
Climb—	
To 10,000 feet	11 minutes.

THE AUSTIN "WHIPPET."

This machine is an addition to the number of post-bellum sporting single-seaters. So far as can at present be discovered it is still in the experimental stage.

SPECIFICATION.

Type of machine	Single-seater biplane.
Purpose for which intended	General run-about for business and pleasure, forest patrol, etc.
Engine type and h.p.	A 45 h.p. twin cylinder horizontal opposed.
Weight of machine empty	500 lbs.
Weight of machine fully loaded	730 lbs.
Tank capacity (for 2 hrs' flight)	Petrol 6½ galls., oil 1½ galls.
Speed low down	90-95 h.p.h.
Speed at 10,000 feet	80 m.p.h.
Landing speed	About 30 m.p.h.
Climb—	
To 5,000 feet	6 minutes.
To 10,000 feet	14 minutes.

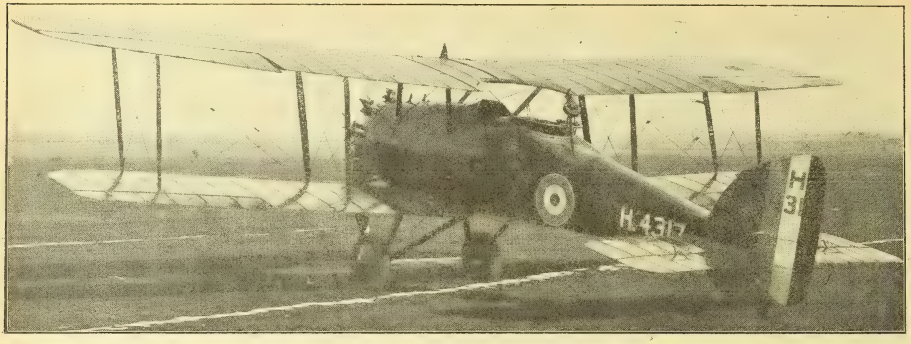
GENERAL PARTICULARS.

FUSELAGE.—This is constructed throughout of steel tubes, bracing wires being eliminated.

ENGINE MOUNTING.—The engine is mounted on a special shock-



Three-quarter Front View of an Austin "Greyhound" (320-h.p. A.B.C. Dragonfly Engine).



Three-quarter View from Rear of the Austin "Greyhound."

absorber device, consisting of four rubber buffers, making a connection between the fuselage and the engine bearers.

Wings.—These have been designed for a high factor of safety, and are of standard construction. They are made to fold back along the body, where they are automatically locked and held up by supporting tubes attached to the fuselage. They are locked in flying position by a special positive locking device. The strut members consist of streamline tubes, tie rods only being used for the centre section.

Tail Plane, Elevators and Rudders.—These are of standard design, the tail plane being made adjustable to correct centre of gravity for different weights of pilots.

Landing Gear.—This is the ordinary "V" type, streamline tubes being used for the struts.

Controls.—These are of standard type, the usual joystick and rudder bar being fitted.

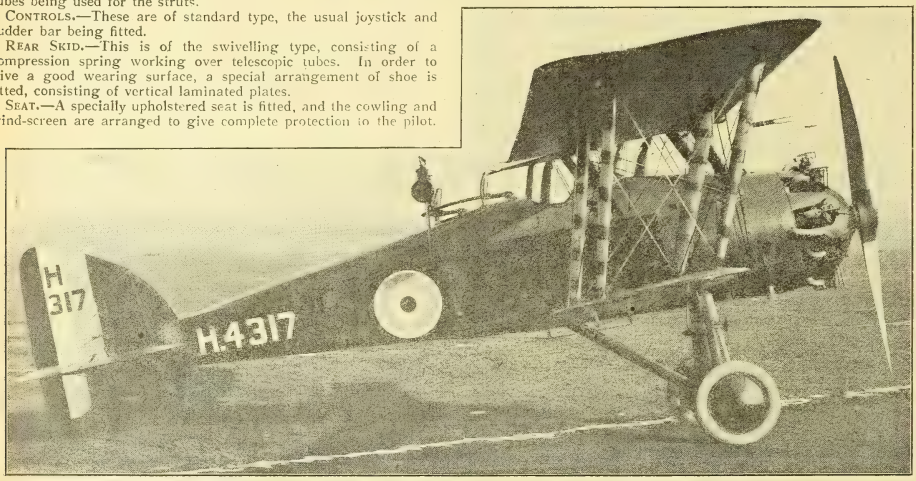
Rear Skid.—This is of the swivelling type, consisting of a compression spring working over telescopic tubes. In order to give a good wearing surface, a special arrangement of shoe is fitted, consisting of vertical laminated plates.

Seat.—A specially upholstered seat is fitted, and the cowling and wind-screen are arranged to give complete protection to the pilot.

Luggage.—A cupboard is provided under the seat to accommodate the pilot's luggage, and any tools it is required to carry.

Engine Controls, Instruments, etc.—For starting a small induction pump is fitted for pumping mixture into the cylinders. The pilot starts his engine from inside the machine by means of a starting magneto.

General Features.—The object of the designers has been to design a machine which will be stable in the air, and will require very little adjustment and attention on the ground, which has a low landing speed, and which can be housed in a motor garage or small shed. With wings folded, the machine can be comfortably housed in a hangar 18 ft. long, 9 ft. wide and 8 ft. high.



Side View of the Austin "Greyhound" (320-h.p. A.B.C. Dragonfly Engine).

A MATTER OF FACT.

Apropos the recent notice of the formation of the firm of Ogilvie and Partners as Consulting Aeronautical Engineers at 104, High Holborn, W.C.1. It appears that one did not do full justice to the responsible post held by Lieut.-Colonel Ogilvie. It was stated in the article in question that Colonel Ogilvie was in charge of Applied Design during the last year of the war. As a matter of fact he came back early in 1917 from Dunkirk, where he had been in charge of the R.N.A.S. Aircraft Depot, which supplied all the Naval Units in that vicinity and on the Somme.

From that time to the end of the war he was practically in charge of all New Design Work under the Air Board, and subsequently under the Air Ministry.

Although he did not at first have entire control of New Design all this work subsequently passed under his control, and there is such a considerable difference between such work and that of the Applied Design side, that it seems well to draw attention to the matter in view of the fact that those who wish to consult Ogilvie and Partners will doubtless wish to consult them on matters considerably more far-reaching than those which were covered by the Applied Design Department of the Ministry of Munitions.

SEAPLANES ON THE AMAZON.

The following letter has been received:—

Sir,—I have just read with interest a letter signed "C. W. P.," in a recent issue of The Aeroplane, in which he makes the statement that the river Amazon is 20 miles wide a thousand miles from its mouth. Does he really mean it, or is it a printer's error? If he does mean it, he surely cannot have been there, and if he asks anybody who has, I think he will be told that even three or four miles would be a very liberal estimate, except in flood time, which is only a small part of the year. At its mouth it is 20 miles or more wide, but a thousand miles up—No; certainly not.

If "C. W. P." contemplates flying up the Amazon, I sincerely hope for his sake that he will not make a bad "landing," for I believe the alligators are generally hungry!

Frank H. H. Adamson.

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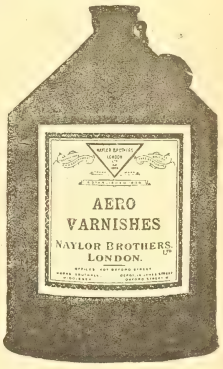
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LONGITUDINAL STABILITY IN PRACTICE.

A Practical Method of Design.

BY C. W. TINSON, F.R.AE.S.

The mathematical work that has been done in connection with the problem of stability of aeroplanes is doubtless responsible to a great extent for the perfection that has already been attained in this most important subject, but many of the published works —for instance, Professor Bryan's "Stability in Aviation"— whilst they are monuments of mathematical ability, are quite beyond the capacity of the average person. They sometimes fail to draw out more than the general ideas to be aimed at, and do not give an exposition of the subject simple enough to apply to conventional practice in the course of the ordinary day's work.

This is in no way intended to detract from the value of works such as the one mentioned, for they are undoubtedly of the very highest importance, but most designers require something more in the nature of formulæ without proofs. This by no means infers that the subject has yet reached the stage when formulæ of the Molesworth type can be employed satisfactorily.

The object of these notes is to present the problem of longitudinal stability in its general form as it applies to the usual type of aeroplane, to deal with it by a simple system of "worst cases," and to get the investigation into such a form that the main points governing the size and mounting of the tail are brought out in a manner lending itself to easy reference and application when designing new machines.

The importance of tail loading, a point which has probably failed to receive the attention it deserves, is strongly emphasised, and the risk attending an alteration to the angle of the tail to correct longitudinal trim when the tail is previously too small and therefore highly loaded, is brought out.

The subject of the downwash has hitherto received very little attention, and in one book the matter is dismissed with the statement that experimentally the downwash angle is half the angle of attack of the main planes, measured from no lift.

Downwash has a very important effect on the selection of longitudinal dihedral and on the condition of the machine at low speeds, and such a rough approximation of its magnitude is by no means satisfactory.

The curve of the downwash given in these notes has been constructed from the very limited information available, and it would appear from theoretical considerations that the magnitude of downwash is likely to depend not only on incidence, but on camber as well. (Fig. A.)

It is also probable that the wash which at small angles of incidence assumes the form of a more or less constant deflection within the limits of the length of an average fuselage, may have a wave length within this compass with certain combinations of speed, incidence and camber, and take the form of a wave following the wings, in which case the phenomenon of "dead water" round the elevators which is experienced in some machines at a definite speed may be explained and guarded against in future.

It is therefore hoped that further informationn will shortly be published giving more light on this matter.

In all the following discussions reference will be made to the qualities of the "Equivalent Plane" of the machine the stability of which is being considered.

The "Equivalent Plane" is an imaginary aerofoil whose lift, drag, position of centre of pressure, and of centre of resistance is identical with those of the actual lifting surfaces employed.

In a monoplane the actual aerofoil answers this description, but in any machine with more than one aerofoil the "Equivalent Plane" occupies some position intermediate between the extreme surfaces which compose the whole lifting surface.

The factors governing longitudinal stability are

(a) PITCHING COUPLE.

(1) Weight of machine.

(2) Distance between Centre of Gravity and Centre of Pressure, depending on Wing Section, chord, angle of incidence (speed), and the position of Static Balance of the machine, which in turn depends on the vertical height of the C.G. and the position of the "Equivalent Plane" in the gap, when the machine is not a monoplane.

(3) Thrust of propeller, depending on throttle position.

(4) Distance from Centre of Thrust to Centre of Resistance, depending on the ratio of the resistance of wings to the general body resistance, which ratio alters slightly with speed.

(b) RIGHTING COUPLE.

(5) Area of Tail Plane.

(6) Section of Tail Plane.

(7) Angle of Tail Plane relative to wind, depending on the downwash and the longitudinal dihedral between wings and tail.

(8) Speed of machine.

With such a large number of variables it is obviously impossible to deal with the problem in an abstract way and equate the two moments in general terms without making assumptions respecting dimensions, wing loading and section, etc., which would restrict the application to one type of machine.

Many of the factors can be eliminated in a machine of the usual type however because their magnitudes are small proportions of the total and can be covered by introducing a generous "tolerance" or latitude for the position of the centre of gravity of the machine, for the weight multiplied by the distance from C.G. to C.P. is the greatest part of the Pitching Couple.

For example, the thrust moment, except in a flying-boat, is small compared to the total pitching couple and can be allowed for by displacement of the centre of gravity longitudinally, and if the tail be of sufficient power to overcome the pitching couple when the centre of gravity is at its extreme positions, allowing a "limit" for its position either side of its estimated position not likely to be reached in practice, this is sufficient to absorb the effect of minor factors.

The vertical height of the centre of gravity, and the position assumed for the equivalent plane in a biplane have a definite bearing on the tail area required, apart from any questions of pendulum effects, which are not taken into account because the length of pendulum in a conventional machine is of no great consequence.

Suppose a machine to be designed for its C.G. to intersect the equivalent plane at 0.3 of its chord when the machine is horizontal. Fig. 2.

If the centre of gravity is some distance below the equivalent plane, the effect is that at high speeds, when the incidence is somewhere in the neighbourhood of zero, the balance or intersection of C.G. with the equivalent plane, is farther back than 0.3, Fig. 1, and at low speeds considerably farther ahead. Fig. 3. (Fig. B).

This improves the case for the tail plane for it tends to reduce the pitching couple at high speed when the centre of pressure is back, and increases it at low speeds when the tail, if small, tends to render stalling easy.

In view of the rather important effect which this feature has on the tail area necessary, it would seem desirable to discover its magnitude if the machine for which the tail plane is being designed is a flying-boat, or one with the C.G. specially low.

In an ordinary tractor biplane, however, the vertical height is not very considerable and omission of the factor guarantees the tail being of adequate area.

If these minor factors are disregarded the pitching couple becomes simply weight of machine by distance between C.P. and C.G., and has two values for every speed, the one corresponding to the C.G. in its most forward probable position and the other when it is farther aft than is likely.

In calculating the righting couple, variable (6) may be eliminated by assuming the tail plane to be of some standard section, T.P.4, say (unless it is required to be a symmetrical in cross sec-

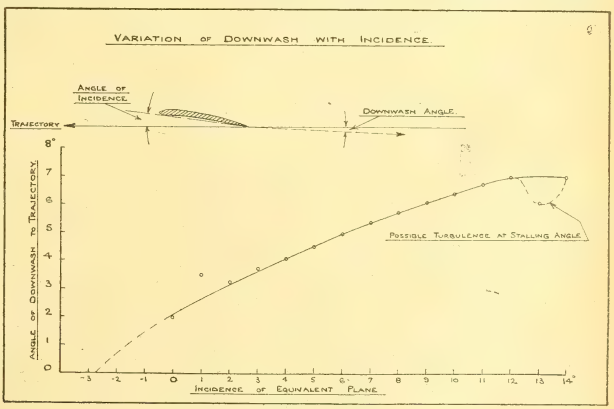


Fig. A.

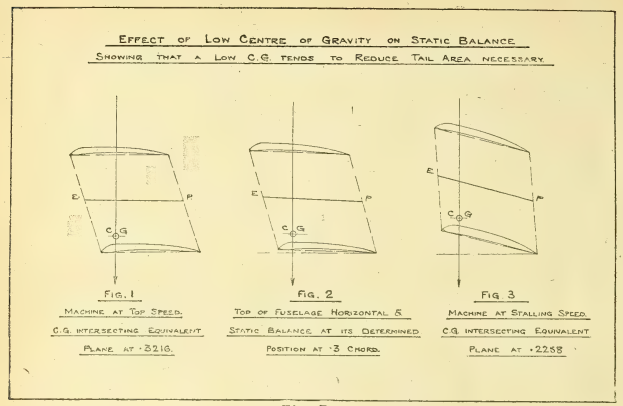


Fig. B.

tion to serve some particular purpose, such as the tail of A.D. Flying Boat).

The figures for the lift of this tail section are suggested as applicable generally, since any variation of camber due to spar depth required will not materially modify the values or the lift per unit area at any particular angle and with a symmetrical section the no-lift position in the speed range will occur at the same place, no lift occurring when the angle to the downwash is zero.

Of the other factors in the righting couple, none can be eliminated, and whilst speed can be said to be an independent factor, the area and angle are inter-dependent, for either a small area at a large angle of incidence, or a large area at a small angle will provide the necessary force required.

These inter-dependent factors bring us to the most important decision to be made in settling the tail unit, and govern to a great extent the "feel" of the machine in the air.

It is well known that one machine may be said to "feel" nice where another with apparently similar comparative stabilising areas, chord and weight is pronounced bad, and on some occasions pilots have given it as their opinion that a machine which did not feel nice was unstable, others would admit tenderness, but would contend that it did not amount to instability.

This introduces the quality which may be termed "Stiffness" in a machine and applies just as much to lateral and directional stability as to longitudinal.

A simple illustration of stiffness directionally is when an arrow oscillates in flight and yet flies straight, that is, its trajectory is a straight one, but its axis makes an angle first to one side and then to the other.

Stiffness is determined by the excess of righting couple over upsetting couple at any given angle of attack, and for stiffness it is required that the rate of change of righting force shall be greater than the rate of change of the force causing deflection.

In the arrow, the trouble can be got rid of by increasing the fin area, but in longitudinal stability this cannot be done without a corresponding alteration to the longitudinal dihedral angle or the machine will trim at a different speed.

On the other hand, an alteration to angle alone will not do, for this would have the same effect if there were no downwash factor, and since downwash governs the real incidence of the tail plane, an alteration to angle alone would shift the position of no lift of the tail in the speed range and might have the effect of producing instability at certain speeds.

The speed of the machine is a very important factor in stiffness, and an increase of power alone will sometimes have a marked effect on the stability of a machine in this respect.

Suppose that by altering the engine of a given machine its speed increases from 80 m.p.h. to 110 m.p.h. and that no other characteristic of the machine is altered.

The tail pressure will be greater in consequence of the increased speed in the ratio $\frac{110^2}{80^2}$ or 1.89 times as much.

In actual fact, it might be slightly more owing to the fact that the wings would be at a slightly smaller angle to get the increased speed with the same area, weight, etc., and as the tail is supposed unaltered it would be running at a greater negative angle and would consequently give rather more than 1.89 times the former pressure.

If the machine were arranged to fly hands off at 80 m.p.h. in the original case it would now have to be altered to fly hands off at its new top speed, and, to do this, the longitudinal dihedral must be reduced.

The effect at landing speed, which would be the same as with the original engine, would be that the tail would be running at a greater positive angle owing to the reduction in dihedral, and would therefore resist the tendency to stall better than it did.

If the tail area was such that before altering the engine the machine was "sloppy" at landing speed, it would no longer be so after increasing the power, and the machine would lose its tenderness and be stiffer at all low speeds.

Also for the same degree of stiffness to be obtained with the engine of lower power, the tail would be nearly twice the area.

To avoid the complicated calculations which would be necessary to ascertain this quality, and provide a short cut for application and comparison in designing tail units, the accompanying table of Relative Stiffness has been prepared and shows that machines which are known not to be tender longitudinally have a stiffness ratio of more than 300, in the units here employed.

RELATIVE LONGITUDINAL STIFFNESS.

The Ratio of Principal Factors in Moments Governing Longitudinal Stability. Stiffness Ratio $\Sigma = \frac{A\,L\,V^2}{W\,C}$

Machine.	Area of Tail, sq. ft. A	Leverage of Tail ft. L	Speed² in m.p.h. V^2	Weight of Machine, lbs. W	Chord of Wing, ft. C	Stiffness Ratio. Σ
Avro	26.0	17 33	1,400	1,800	4 73	338
B.E 2c	38 5	16 2	7,220	2,140	5 5	382 5
Bristol Scout D	23.0	12.67	9,150	1,250	4 5	474
,, ,, F	15.0	12 67	19 000	2,100	5.3	328.
,, Monoplane	20.0	13 9	16,400	1,300	5.92	592
,, Fighter	22 2	17 0	15 600	2,800	5 5	380
,, Bomber	96.5	32.5	11,250	16,200	8.5	256
D.H.4 (370 h.p. Rolls	38.0	18 0	18 640	3,472	5 5	668
D.H 4 (275 h.p. ,,)	38 0	18.0	13 700	3,400	5 5	500
D.H.9 (230 h.p. B.H.P.)	38 0	16.6	13,450	3,300	5 5	468
D.H.9A (Liberty)	38.0	17.5	16 640	4,220	5.75	336
D.H.10A (,,)	75 0	22.0	17,950	8,500	7.0	500
Gotha (Twin)	45 0	23.3	5,780	8,763	7 47	92.5
Handley Page (0.400)	110.0	45.0	9,030	13,172	10 0	339·5
S.E 5A	14.7	12.66	19,60	1,90 0	5.0	369
Short (184)	45 0	21.0	5,595	4 900	5.0	216
Sage 3	26.0	14.21	5,040	2,000	4 75	196
,, 4	24.4	15 5	9 410	2,650	5.25	276
Sopwith Camel	14.0	11 0	13,920	1,450	4.5	328 5
,, Pup	23 0	12 0	12,100	1 290	5 13	511
,, Cuckoo	35 6	18 6	0 000	3,370	6 75	290
A. D. Flying Boat (150 h.p.)	39.1	14.75	8,470	3,327	5.5	267
,, ,, ,, (00 ,,)	39 1	14 75	8,470	3,561	5 5	251
Cody (Cathedral)	10.0	16 75	5 240	2 680	5 5	59 6

The expression for the Modulus of Stiffness omits one factor of importance, the longitudinal dihedral, as this is not known for some of the machines and others have adjustable tails which makes it rather awkward to take it into account, but the most important variables are the weight and the speed, so the omission of the dihedral does not lower the utility of the values very much from the point of view of comparison between different machines.

Included on the list are two machines with which the writer has had a good deal of experience. These two machines, Sage 3 and Sage 4, are practically the same in external appearance and the chord, wing area, tail area and tail leverage were identical.

The speed of Sage 4, however, is 97 m.p.h., whilst that of Sage 3 is 71 m.p.h., and the weights 2,875 lbs. and 2,000 lbs., respectively.

The stiffness, whilst not directly as $\frac{97^2}{71^2}$ owing to the increased weight of the faster machine, was distinctly improved and the faster machine is very nice longitudinally whilst the slower one was like a "box-kite."

It will, however, be noticed that though the stiffness has been raised to 276 it is still lower than the average and this, in conjunction with the writer's experience, suggests the figure of 300 as being the lowest ratio designers should allow.

The table of Relative Stiffness of machines shows a wide range of variation, and demonstrates that with this ratio as low as 100 there is still enough tail area to permit the machine to be flown satisfactorily.

(To be continued.)



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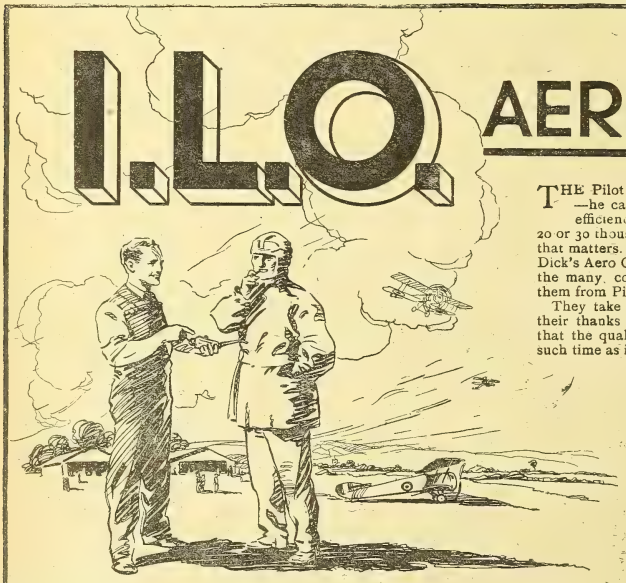
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MARKET TOPICS.

PRICES ARE FOR QUANTITIES ON USUAL TERMS.

MAY 21st, 1919.

COPPER.—This market is certainly firmer, but actual consumers still hesitate, although, as stated last week, their attitude may be influenced by the uncertainty of the prices of other metals. The huge accumulations of stocks in various parts of the world are also causing them to act very cautiously. There is a fairly good demand for manufactured Copper, notwithstanding the high prices which are still out of all proportion to the prices ruling for Ingot.

The market this week has been very active, and fairly large purchases have been made, chiefly for forward delivery. It is understood that the demand by Cable firms is responsible for the renewed activity.

The American Copper market is a little more active. Nevertheless, it is reported that there will be a further curtailment of production, as consumption appears to be still lower than the quantity produced.

COMPARATIVE PRICES.

	Per Ton. £ s. d
To-day, May 21st	70 10 0
Last week	77 10 0
Last month	76 15 0
Average price, 1918	115 10 0

TIN.—Although actual consumers are not very active, the market continues firm, and prices, though occasionally irregular, have not indicated any marked sign of weakness. The outlook is still uncertain and the position at present demands caution.

The market yesterday was weak, pressure being brought to bear by the selling side, and the market shows signs of a decline.

American buyers are expecting the removal of the Tin restrictions and the general opinion is that permission will first be given for imports from the Straits before the embargo on other countries is lifted.

COMPARATIVE PRICES.

	Per Ton. £ s. d.
To-day, May 21st	236 0 0
Last week	236 10 0
Last month	224 0 0
Average price, 1918	329 10 0

LEAD.—Consumers are fairly active in this market and the demand is good; there is, of course, room for much improvement, but considering the general reluctance of buyers in other markets the interest shown by actual consumers of Lead is fairly satisfactory.

It is difficult to understand why the Government maintain their price at £25 when American Lead is being offered at £24 7s. 6d. and £24 5s. c.i.f. Liverpool for May and June shipments respectively. The conclusion was that they would have reduced the price in order to reduce the large stocks which are being held by them. The motive for this policy is very obscure, but the result is that merchants are compelled to buy American Lead.

STEEL.—There has certainly been a falling off in orders for finished Steel, and the demand for Alloy Steels is practically at zero. There is a feeling of uncertainty, and buyers are hesitating, evidently expecting that American competition will bring prices down. Some authorities state that there is no news of American material having been offered at prices which show an advantage over the prices ruling here.

On the other hand, consignments of Iron and Steel have been received from America, and, although there may not at present be much difference in the price of Steel, the situation is being very carefully watched, and the general position, which is certainly very uncertain, calls for caution.

The demand for Aircraft and High Speed Steels continues dull, and there is at present no sign of renewed activity.

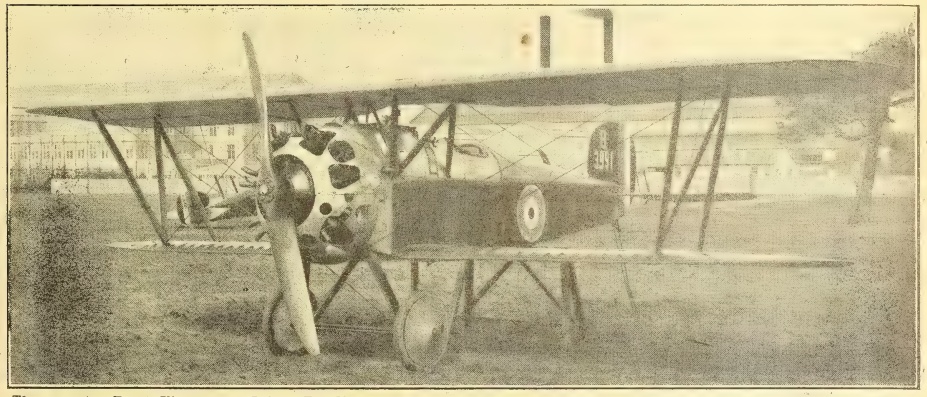
TIMBER.—The market continues to show signs of activity, but there is still room for considerable improvement. So far as Aircraft Timber is concerned, there is very little demand. In any case, firms who are in need of timber should exercise the utmost care, as the stocks which are held by the Government are very unreliable, and it is even reported that probably only 15 to 20 per cent. of the material is any use for aeroplane construction.

The Hardwood market is fairly strong, and prices continue to harden. The demand for Honduras Mahogany is particularly healthy. This, of course, is due to the peace-time trades getting into their stride again. It will, of course, be some time before they are working "all out," and, when this takes place, the demand will be very large indeed. It would not be surprising to see values harden.

FABRIC.—There is nothing further to report, although it is understood that large quantities of Aeroplane Linen have been disposed of in Ireland, at a figure somewhere in the vicinity of 1s. per yard, 36 inches wide. No official intimation has yet been issued as to the disposal of the huge stocks lying at the stores in this country.

A MEMORANDUM FOR INVENTORS.

Mr. E. S. Andrews, B.Sc., Eng., has resigned his appointment as technical officer under the Air Ministry and entered into partnership with Major J. Harold Beaumont, who is a registered patent agent, at 29, Southampton Buildings, London, W.C.2, for the joint practice of consulting engineering and patents work. Both partners were for many years before the war members of the Examining Staff of H.M. Patent Office. The firm will be known as Andrews and Beaumont.



Three-quarter Front View of the Bristol F.1 Single-seater with the Cosmos "Mercury" Engine of 315 h.p. **(See page 2130).**

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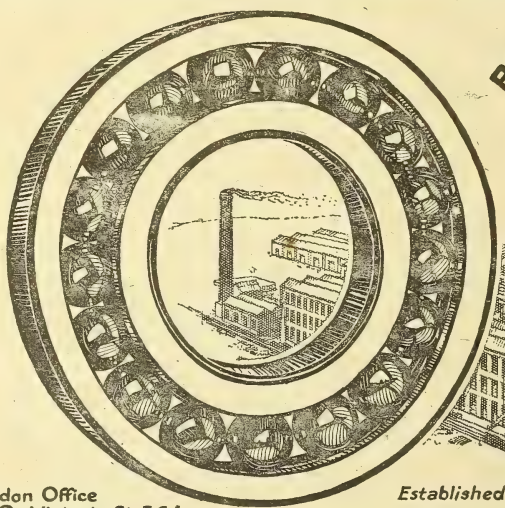
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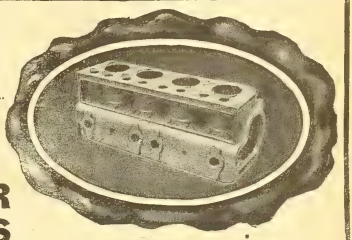
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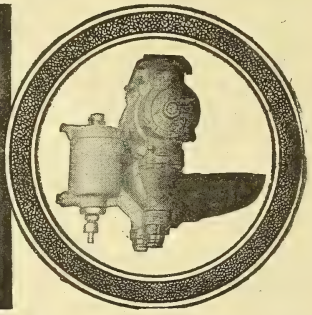
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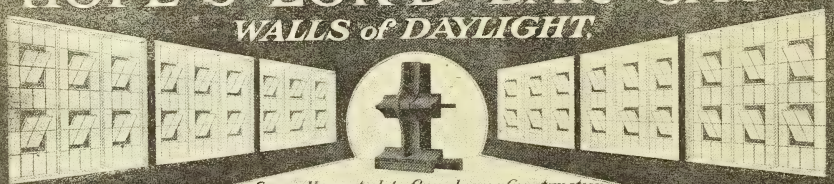
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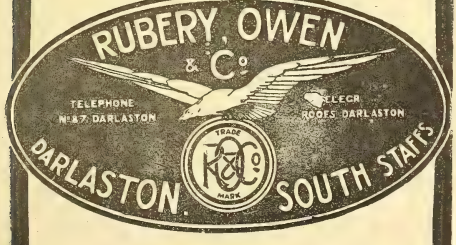
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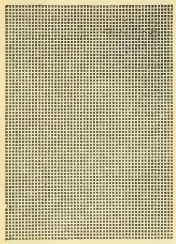
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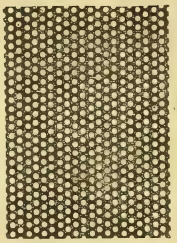
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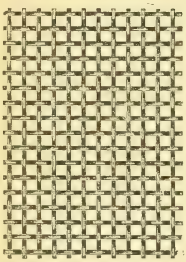
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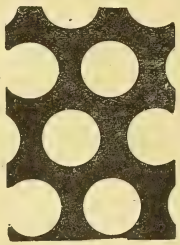
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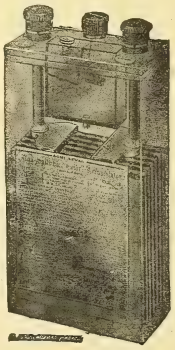


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COMMERCIAL AERONAUTICS & CIVIL AERIAL TRANSPORT

THE COST OF SPEED: TWO ASPECTS OF THE SUBJECT.

By "MEDWAY."

It is obvious enough that if we want speed we must pay for it. We cannot expect a method of transport capable of conveying passengers and goods at 100 miles an hour to be available at rates as low as those possible to a system which works at 2 miles an hour. The aeroplane and the canal barge represent our two extremes. The former is right ahead of all other methods as regards its speed capabilities.

But while we admit that we must pay for speed, there is always the question of what price we are prepared to pay. By taking the average from a number of expert opinions, I find that the general view is that, other things being equal, we must increase power by about 50 per cent. if we wish to increase speed from 110 to 120 miles per hour.

Increased Fuel Consumption.

Now, the mere increase of power, if it meant nothing more than the use of a rather larger and heavier engine, would not necessarily involve a very big increase in the cost of running. If we take the case of an aeroplane designed to carry about one ton at about 100 miles an hour and fitted with engines of about 700 horse-power, the fuel consumption would probably be about 40 gallons per hour. A 50 per cent. increase in power may be taken roughly to mean a corresponding increase in consumption. The extra expenditure would, therefore, be about 20 gallons per 100 miles, which, with petrol at 2s. 6d. per gallon, is equivalent to 6d. a mile. This in itself probably would not make the difference between profit and loss in one case out of a hundred.

We must, however, reckon a somewhat bigger repair bill for the more powerful engine. Also, we have paid a higher price for it, and must, therefore, make a bigger allowance per mile for its depreciation. Altogether, then, an increase from 100 to 110 miles per hour might mean an increase of something in the neighbourhood of 9d. a mile in running costs; always assuming that when we increased the power we did not alter the load-carrying capacity of the machine.

The Chief Difficulty.

This is just where the snag comes in. If we are to make a non-stop run of 100 miles, the difference of 20 gallons in the consumption means that the more speedy aeroplane must carry 20 gallons extra of fuel at 8 lbs. to the gallon. This means an extra dead weight of 160 lbs. at the commencement of the journey. This amount must, therefore, be deducted from the useful load which would otherwise be carried. The reduction in this case is not a very big percentage of the total load, being about 1½ cwts. out of one ton.

If the non-stop run, instead of being 100 miles, is to be 500, our extra cargo of petrol at the start will weigh about 7¼ cwts. Our useful load-carrying capacity is, therefore, reduced by something like 40 per cent.

The other day some figures were published in connection with a new type of Handley Page. It was stated that for a non-stop run of 100 miles the useful load that could be carried was 5,750 lbs. For a non-stop run of 800 miles, the useful load would only be 2,500 lbs., a reduction of well over 50 per cent.

This evidently means that over the balance of 700 miles petrol weighing 3,750 lbs. would be consumed. This gives us a consumption of about 460 gallons for 700 miles, or approximately 66 gallons per 100 miles.

Long Non-Stop Journeys.

The point I wish to emphasise is, however, the huge difference in load-carrying capacity resulting from attempting to make a long non-stop journey. Suppose our flying speed to be 100 miles an hour, and supposing that we make a stop to replenish fuel supplies at the end of every 100 miles, the duration of this stop being a quarter of an hour, we have, therefore, reduced our effective flying speed to 80 miles an hour instead of 100. By so doing, we have rendered it possible to carry about 2½ tons of useful load instead of only about 1 ton.

If we make the non-stop run with 1 ton of useful load, we must charge rates high enough to show a profit.

It is most improbable that we could run the service commercially if the charge were less than 7s. 6d. per mile, or in this case 7s. 6d. per ton-mile.

Now, if we arrange to stop at intervals of 100 miles to pick up petrol, and to carry 2½ ton loads, we can quote approximately 3s. a ton-mile for the work. The question is, then, which would appeal most to the man who provides the load? Will he prefer to pay 3s. a ton-mile and to have the stuff conveyed at 80 miles an hour or to pay 7s. 6d. and have it conveyed at 100 miles an hour?

If we are discussing passengers instead of goods, and if we count 12 passengers to the ton, we have the alternative of 3d. a mile at 80 miles an hour or 7½d. a mile at 100 miles an hour. This comparison is, of course, simply for the same machine running as an express or as what one may call a local.

Local and Express Services.

These figures will show a big difference in principle as between the aeroplane and the railway. The express train involves somewhat higher costs per mile than the local stopping train, but the difference is nothing like that shown above, and in practice, with a few exceptions, the same fares are charged whether the passenger uses the stopping train or the express.

A factor which might tend to neutralise the difference to some extent is that the express aeroplane service would be far less dependent on intermediate landing grounds. These would only be required for emergency purposes, but, unless the whole of the service over a given route is express, then the landing grounds will have to be provided in any case, and consequently very regular use would not involve any serious extra expenditure.

One thing that follows naturally from the whole of this argument is that aerial traffic of a trans-Atlantic or similar character must be conducted at much higher fares and rates than we could get down to in the case of a service which operates over land, and, therefore, gives facilities for frequent replenishment.

Frequent Stops for Fuel.

If we inaugurate a service which is not in competition with the railway or steamship at all, but merely competes with some slow form of transport, such as the animal-drawn vehicle, we should probably find it best

to provide stopping-places at such frequent intervals that in no case is the weight of fuel that has to be carried an appreciable percentage of the weight of the useful load.

As already indicated, we could as a rule bring down the weight of fuel to something like 4 per cent. of the useful load, or even less, provided that we picked up fresh supplies every 60 miles or so. Such frequent stops would make a big difference to the overall speed of the journey. Were we in competition with an express railway service, averaging 50 or 60 miles an hour, we could not afford to incur so many delays. Were we to do so, it would mean that we should have no appreciable advantage in speed, though we should almost certainly have to charge higher fares, and for some time to come our services would probably be less regular and frequent. Thus, where railway connections are direct and good, we must necessarily arrange for long stages, even if by so doing we make it necessary to put up our rates.

Problems to be Faced.

It is to be feared that this article does not do much more than show from one aspect what a complicated problem the promoters of aeroplane services have to face and what a big influence their initial decisions upon apparently minor points may have upon the success or failure of the enterprise.

It may, however, serve to bring home to some people who have not previously considered it sufficiently the fact that there are more reasons than one why high overall speed for long journeys is not at all compatible with the reduction of fares to anything approaching a minimum. It may also indicate how little reliance can be placed upon casual estimates of working costs and fares that must be charged, when these estimates omit, as they so often do, any statement as to the length of the stages and the real overall speed of the journey as distinct from the flying speed while the machine is actually in the air.

AN HOTEL AIR SERVICE.

According to the "Times," the Hotel Traymore, one of the great Atlantic City hostelries, is the first to bring its guests to its door from their homes by aeroplane.

Atlantic City, which is at present holding an international aviation meeting, is a great seaside resort for the people of Philadelphia, the two places being in much the same relation as London and Brighton. The proprietors of the Traymore, having purchased two aeroplanes, will maintain a service between the two cities, thus starting the first hotel air service in the world.

The two machines, which made the first trip yesterday (May 3rd), accomplished the journey in half an hour, landing safely on the beach immediately in front of the hotel.

ENTERPRISE IN CHILE.

A regular aeroplane mail service is to be maintained between Santiago and Valparaiso—the two main centres of population in the Republic of Chile. The Chilian railway system is notoriously lethargic, so that the journey between the two cities occupies some three hours, excluding a wait for half an hour or so which is the invariable rule at the halfway junction of Llay-Llay. The new mail-carrying system which has now been in successful operation for some weeks, is being maintained with a number of the "Bristol" monoplanes, which were recently presented by the British to the Chilian Government.

The Work of the Handley Page Commercial Service in the First Fortnight of Civil Aviation.

Date.	Pilot.	No. of passengers including Pilot	Cargo.	Weight	Route.	Remarks.	Time in Air.	No. of miles.
May 1st.	Lt.-Col. Sholto Douglas.	11		1650 lbs.	Cricklewood—Manchester.	O.K.	3 hrs. 40 mins.	165
,, 3rd.	Major Foot.	8	"Evening News."	2000 lbs.	London – Brighton—Eastbourne—Hastings—London.	O.K.	2 hrs. 15 mins.	150
,, 5th.	Lt.-Col. Douglas.	5	"Daily Mail."	1600 lbs.	Manchester—Carlisle—Dundee—Aberdeen—Montrose.	O.K.	4 hrs. 25 mins.	315
,, 5th.	,, ,,	4		600 lbs.	Montrose—Dundee—Turnhouse (Edinburgh).	Thick mist.	1 hr. 35 mins.	80
,, 6th.	,, ,,	5		750 lbs.	Turnhouse—Carlisle—Preston—Manchester.	Rain and mist.	3 hrs. 50 mins.	225
,, 6th.	Major Foot.	4	"Daily Mail."	1400 lbs.	London—Bristol—Exeter—Plymouth—Bristol.	O.K.	5 hrs. 25 mins.	310
,, 7th.	,, ,,	4		600 lbs.	Bristol – London.	O.K.	1 hr. 50 mins.	110
,, 9th.	,, ,,	4	"Daily Mail."	1600 lbs.	London—Southampton—Bournemouth—Ryde—Portsmouth—Eastleigh	O.K.	2 hrs. 40 mins.	155
,, 9th.	,, ,,	8		1200 lbs.	Eastleigh—London.	O.K.	1 hr. 20 mins.	70
,, 9th.	Lt. Walker.	5	"Daily Mail."	1400 lbs.	London—Cardiff—Swansea—Bristol.	O K.	3 hrs. 25 mins.	250
,, 9th.	,, ,,	4		600 lbs.	Bristol—London.	O.K.	1 hr. 50 mins.	110
,, 10th.	Lt.-Col. Douglas.	5	"Evening News."	2000 lbs.	London—Southend—Broadstairs—Ramsgate—Folkestone—London.	O.K.	3 hrs.	169
,, 11th.	Lt. Walker.	5	"Weekly Despatch."	1550 lbs.	London–Norwich–Cromer–Yarmouth—Norwich.	O.K.	2 hrs. 25 mins.	185
,, 12th.	Lt.-Col. Douglas.	6	"Daily Mail."	1700 lbs.	London—Northampton—Lichfield—Birmingham.	Low clouds —mist.	3 hrs. 26 mins.	180



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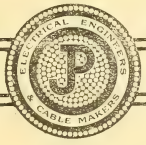
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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

CIVIL AERIAL TRANSPORT NOTES.

United Kingdom.

Boulton and Paul, Ltd., of Norwich, report that on May 15th Capt. E. L. Simonson, with Mr. H. Fisher as passenger, flew to attend the cricket match, Australians v. Mr. Lionel Robinson's XI., and to take photographs from the air. The pilot, Capt. Simonson, is an Australian officer awaiting demobilisation, and is spending his time in the designing department of Boulton and Paul, Limited, together with a number of his colleagues. They landed in a field adjacent to the cricket ground, where they were warmly greeted by Mr. Robinson, and returned to Norwich after the game.

On May 19th, Capt. E. L. Simonson, with Lieut. Jones as passenger, flew to Hadleigh to attend to some business on the part of the passenger.

The undermentioned flights were made from Hounslow last week :—

May 18th.—Colonel Henderson flew a five-seater Avro with three passengers, including a 'Daily Mirror" representative, to Plymouth, in order to meet the American seaplanes which were reported to have left Lisbon.

May 24th.—Mr. Allingham, of Messrs. Francis, made a commercial call by an Avro from Hounslow to Braintree. His object was to call on a client on important business. The machine left Hounslow at 9.35 a.m., and arrived at Braintree at 10.30.

May 25th.—A three-seater Avro, piloted by Mr. R. F. Park, late of the R.A.F., flew from Hounslow to Droxford, for delivery to Capt. Mackenzie Grieve, the father of Commander Grieve. The machine left Hounslow at 3.5, arrived at Droxford at 3.50, left Droxford at 4.40, and arrived at Hounslow at 5.15.

An aeroplane service began on May 26th between Manchester and Blackpool. The aeroplanes will start from Manchester, and the fare is five guineas.

It is stated that in the future three aerial services are to be run from Manchester to the Isle of Man, Scotland, and Ireland.

A dance will be held at the South-Western Hotel, Southampton, on Saturday, June 7th. The guests and band will fly from Hounslow aerodrome for Southampton, under the direction of Lieut.-Col. Henderson, at about 5.30 p.m. on June 7th, and return by air the following morning. Three-seater Avro biplanes will be used, and luggage may be carried. Hotel accommodation will be provided.

The tickets, of which only a limited number will be available, can be obtained from the usual theatre ticket agencies, from 6, Cambridge Square ('phone, Padd. 6213), or from the Lepaerial Travel Bureau, Piccadilly Circus ('phone, Gerrard 4387).

What will happen if it is wet?

A passenger and commercial air service between Hull and Hartlepool was inaugurated by the arrival of a Blackburn Kangaroo biplane, piloted by Mr. R. W. Kenworthy, at Hull, at 5 p.m., on May 26th. There were three passengers. The distance covered was 100 miles. About one hour was taken on the journey.

The Avro Company are offering twenty-five flights by auction at the Theatrical Garden Party, which takes place at the Botanic Gardens on Friday,, May 30th. They are to be auctioned in André Charlot's "Monte Carlo" booth. The auctioneer has yet to be chosen.

THE DEVELOPMENT OF CIVIL AVIATION.

Major-General Sir F. H. Sykes, Controller-General of Civil Aviation, addressed the Liverpool Chamber of Commerce on May 26th on some aspects of commercial aviation. He emphasised once more the importance of ensuring a very high standard of efficiency and trustworthiness in British pilots. In order to achieve that standard the British air pilot would pass through a school of aerobatics, but he would never "stunt" except for practice, and on such occasions he must be alone and away from towns.

STUNTING.

"We intend," he added, "severely to discourage 'stunting' in the popular sense of the term." Incidentally the lecturer mentioned that of the accidents reported since the 1st inst., when civil aviation was opened, only three cases of injuries had occurred in "civil" machines, and none of those was fatal.

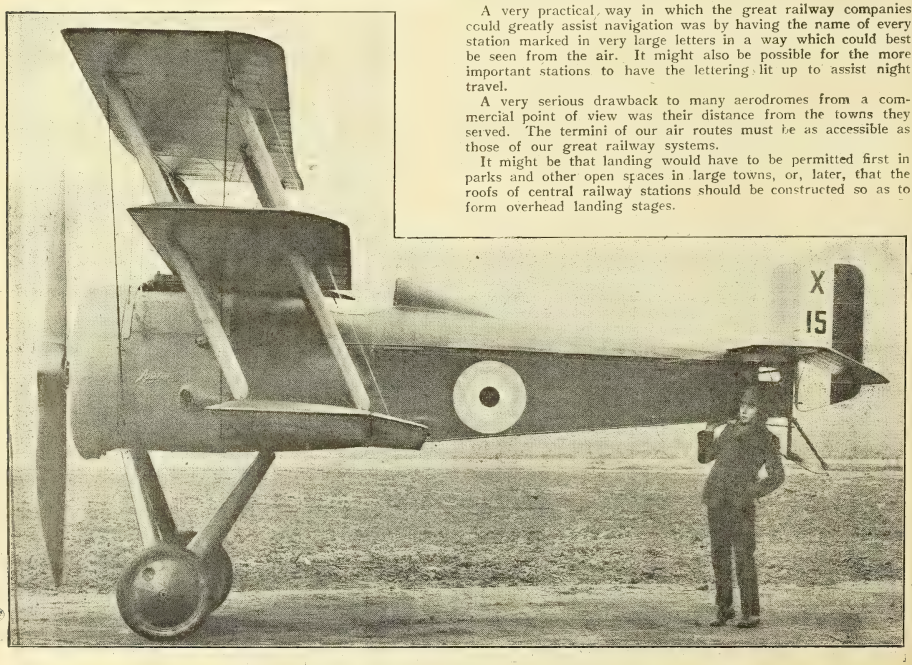
Touching upon methods of assisting the air navigator which remain to be developed, he said the first was directional wireless, which entailed the setting up of large wireless stations—"the only safe means by which aircraft on long-distance over-sea passages may safely know their position." It was hoped, in the course of the development of our meteorological service, to discover consistent wind currents analogous to ocean currents, and thus furnish the airman with air charts.

STATION ROOFS AS LANDING PLACES.

A very practical way in which the great railway companies could greatly assist navigation was by having the name of every station marked in very large letters in a way which could best be seen from the air. It might also be possible for the more important stations to have the lettering lit up to assist night travel.

A very serious drawback to many aerodromes from a commercial point of view was their distance from the towns they served. The termini of our air routes must be as accessible as those of our great railway systems.

It might be that landing would have to be permitted first in parks and other open spaces in large towns, or, later, that the roofs of central railway stations should be constructed so as to form overhead landing stages.



An Experimental Austin Biplane (130 h.p. Clergét Engine).



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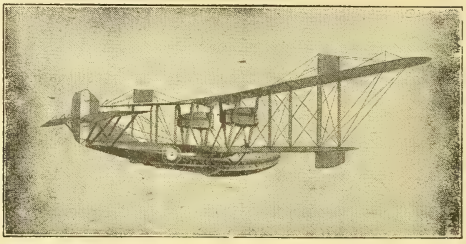
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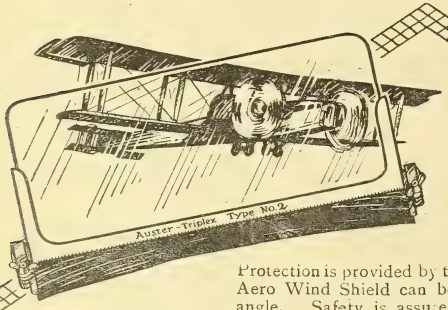
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AIRCRAFT FINANCE

THE WHITEHEAD AIRCRAFT RESULTS.

Working under State protection and encouragement has disadvantages as well as compensations. The Aircraft Industry can scarcely complain of its experiences of the past year or two. Generally the advantages have appreciably counterbalanced the disabilities. This being admitted, one must express surprise at the poor results published by the Whitehead Aircraft (1917), Limited.

FRANKLY DISAPPOINTING.

Covering the operations of the fifteen months to September 30th, 1918, the balance-sheet shows a profit of £24,087. Frankly, this is very unsatisfactory. There is deducted from this sum the amount of £4,400, being "estimated profit prior to incorporation, applied to writing down goodwill." The balance at profit and loss is therefore £19,687. Deducting the dividend on Preference shares for the half-year, *i.e.*, £9,304, there remains about £10,383, out of which the final dividend on these Preference shares has been paid. There is a very small balance left.

THE DIRECTORS' BREVITY.

The directors are not at all communicative. "During the period under review," they remark, "the company has been a controlled establishment, and its operations have been entirely confined to work under Government contract. A large number of aeroplanes have been delivered during the period, and the quality of the work turned out has been maintained at a high level."

THE SHARES ISSUED AT A PREMIUM.

This affords hardly any compensation for the quality of the results. Harking back to March, 1918, when the public were invited to subscribe for 450,000 10 per cent. Cumulative Participating Ordinary shares of £1 each at a premium of 1s. 6d. per share and 100,000 Deferred ordinary shares of 1s. each at a premium of 4s. per share, one notices the remarkable contrast between the actual performances and the actual promises given then.

WHAT WAS ASSUMED.

Under date of March 21st, 1918, there is a letter by Mr. J. A. Whitehead, founder of the business and life governing and managing director, embodied in the prospectus. It is stated, amongst other things, that the present turnover is "at the rate of more than £1,000,000 per annum, or nearly six times the rate per annum of the turnover during the fifteen months ended June 30th, 1917. With the use of the additional working capital which this issue will provide, the production for 1918 obviously should be materially increased beyond the present rate of £1,000,000 per annum above mentioned.

"Assuming the net profits on the turnover are maintained in the future at the same rate as in the past, they should be more than sufficient to pay the fixed dividends on the entire share capital of £1,000,000. This is without allowing for the earning capacity of the new capital."

THE BALANCE-SHEET.

An examination of the accounts submitted does not afford much enlightenment. The absence of a Profit and Loss Account, indicating the volume of business transacted and expenses connected with the business, is customary with controlled establishments. One can therefore easily excuse its absence. Balance-sheets merely indicate the position. One finds, figuring among the assets, an item of £32,452 for "preliminary expenses," and also an item of £35,625 for "commission on shares issued."

THE AUDITORS' REMARKS.

These items are mentioned by the auditors, who remark that "Nothing has been written off commission on shares issued or preliminary expenses, and no provision has been made for Income Tax, other than deductions from interest and dividends paid, or for Excess Profits Duty (if any)." On the other hand, there is an item of £21,310 received as premiums on shares issued. The balance-sheet shows that there are First Mortgage Debentures, with interest accrued thereon, figuring at £147,015, and also advances by H.M. Government, with interest accrued thereon, secured by Second Mortgage Debentures, figuring at £203,010.

A ROUGH CALCULATION.

For the purpose of illustrating the discrepancy between the assumptions embodied in the prospectus and the actual results achieved one may indulge in a rough calculation. In order to meet the "fixed dividends on the entire share capital of £1,000,000" there would be required a sum of approximately £95,000. In order to pay the fixed dividends on the capital actually issued, which, according to the balance-sheet, is £518,697, less calls in arrear of £1,653, reducing the amount to £517,045, the sum of approximately £45,000 would be involved.

NAPIERS' FINE ACHIEVEMENT.

The subject not calling for any discussion, one may turn to the satisfactory results achieved by D. Napier and Son. These are quite up to the best expectations. It is remarked that the company has been entirely employed on Government work during the period under review ended September 30th last, and that with the increased facilities of additional premises and plant referred to in the last report, has been enabled to still further increase its output to a figure exceeding all previous years. "Important progress in the development and manufacture of aero-engines has been made during the past year. The Napier engine known as the 'Lion' has already established its reputation for record performances, including the altitude record."

A COMPARISON OF THE PROFITS.

After allowing for depreciation of premises, plant, and tools, the profit amounted to £142,336 compared with £125,376 for the previous financial year, £73,962 for 1915-6, and £67,758 for 1914-5. The sum of £35,000 against £20,000 previously has been added to the reserve fund, bringing it up £95,000 and in addition to the 10 per cent. dividend, subject to tax, there is a bonus of 2s. 6d. per share, free of tax, instead of 1s. 6d. per share. The balance-sheet shows an item of £300,000, representing goodwill and figuring as an asset.

WM. J. DAVIES.

CURRENT TOPICS.

CONVERTING THE BIG FUNDING LOAN.

A few healthy reactions have benefited the Stock Exchange, and, were it not for the suspicion that the Government may soon decide to carry through at an early date the big Funding Loan operation, conditions might have been even more buoyant

than they are. This big Funding Loan will afford a considerable relief in many ways when it is out of the way. It is a big operation, however, and will take some time to masticate and digest. Then the flood of new capital for industrial developments will break out afresh.

AIRCRAFT SHARES.

As a whole, aircraft shares have been quiet. There have been transactions in Whitehead Aircraft 10 per cent. Participating Ordinary on the basis of 5s. to 5s. 9d. Handley Page new shares have fallen away to 18s. Aircraft Manufacturing Preference move about 20s. now and again, and the B Preference about 20s. 6d. Napiers have been wanted for the bigger bonus about 35s., the new shares being 32s. 6d.

THE FELLOWES MAGNETO CAPITAL.

Last year Fellowes Magneto Company found it necessary to increase its capital because of the development of the business, and now the paid-up capital, which is £114,696, is to be doubled so as to provide the requisite funds for increasing the capacity of the factory and for dealing with the extension of the business. It is intended to issue the new capital as and when required.

PROFITS AND DIVIDENDS.

After allowing £4,638 for depreciation and the writing down of preliminary expenses, the profits of 1918 amounted to £14,129 against £8,514 for the previous period of eighteen months. In addition to the final cumulative dividend of 4 per cent., the Preference shares receive 1½ per cent. under the participating scheme, making 9½ per cent. for the year, and the dividend on the Ordinary shares is 24 per cent. A balance of £3,130 is carried forward.

THE BEARDMORE ACCOUNTS.

Vickers, Ltd., hold a large proportion of the Ordinary shares of Wm. Beardmore & Co. Some people are not acquainted with this fact, which is not a war development, but one of long standing. The company is two or three years behind with the publication of its annual report, because, as is the case with many other businesses, there are differences with the Government to be negotiated. However, it is proposd to pay a 6 per cent. dividend, free of tax, on the Ordinary shares. This is the same as for the previous financial year.

FRENCH ITEM.

The French De Dion-Bouton Company made a gross profit last year of 9,772,089 francs. The dividend is 6 per cent. on the Privileged shares and 5 per cent. on the Ordinary. The sum of 1,250,000 francs is provided for special purposes. An issue of 12,000 bonds of 500 francs each, bearing 6 per cent. interest and redeemable in twenty years, commencing 1924, is being made. The price is 490. These are free of tax, present or future.

THE SIDDELEY-ARMSTRONG AMALGAMATION.

The directors of the Siddeley-Deasy Motor Car Co., Ltd., beg to announce that the offer made by the Armstrong-Whitworth Development Co. for the exchange of shares having been accepted by the holders of 92½ per cent. of the shares, such offer is now binding and the new certificates will be issued in due course.

AN AERIAL TRAVEL BUREAU.

A new Handley Page ticket office, called the Leparial Travel Bureau (Telephone, Gerrard 4387), has recently been opened at Piccadilly Circus. The bureau will also act as agents for other aviation companies and for railway and steamship companies. Illustrated brochures, explaining in full the new Leparial service, will be sent post free on application. The proprietors of the bureau are the Lep Transport and Depository, Limited, of Castle Street, Long Acre, W.C. 2. The telephone number of this company is Regent 5805 (seven lines).

NEW COMPANIES.

W.T.T. ENGINEERING CO., LTD.—Private company. Registered May 16th. Capital, £10,000 in £1 shares. To take over the business formerly carried on at Burnham Street, Kingston-on-Thames, and now at 6-10, Dalling Road, Hammersmith, as the Aeroplane Components Co., and the business carried on at the last-named address as the General Aircraft and General Engineering Co., Ltd. The subscribers (each with one share) are: C. Liney, 7, Phene Street, S.W.3, solicitor's clerk; E. O. Gilland, Eaton Lodge, Hockley, Essex, company secretary. First directors: M. J. Ward, B. Tretl, and H. F. Tully. Registered office: 6-10, Dalling Road, Hammersmith.

AIRCRAFT COMMUNICATION AND METEOROLOGICAL SURVEY CO., LTD.—Private company. Registered May 19th. Capital, £2,000 in £1 shares. To make surveys for air routes, aerial railways or otherwise, to design and plan "air routes for air route construction," to negotiate for and obtain contracts for the building of air routes and aerial railways, and to carry on the business as indicated by the title. The subscribers (each with one share) are: J. D. N. Molesworth, 224, Martins Lane, E.C. 4, engineer; A. Sterry, 24, Martins Lane, E.C. 4, solicitor. First directors to be appointed by the subscribers. Registered office: 24, Martins Lane, E.C. 4.

BYGLOVERZA, LTD.—Private company. Registered May 14th. Capital, £2,000 in £1 shares. Engineers, manufacturing chemists, printers, publishers, publicity experts, etc. The subscribers (each with one share) are: G. H. Glover, 187, Camberwell New Road, S.E. 5, incorporated secretary (director of Resonance, Ltd., and Hydrates, Ltd.); H. N. Ballantyne, Caerlee, Inverleithen, Peeblesshire, woollen manufacturer (director of Hy. Ballantyne and Sons, Ltd., Sunbury Aviation Co., Ltd., Resonance, Ltd., and Hydrates, Ltd.). First directors: G. H. Glover and H. N. Ballantyne.

DE DION-BOUTON, LTD.—Private company. Registered May 16th. Capital, £160,000 in £1 shares (80,000 8 per cent. cumulative preference). To enter into an agreement under which H. O. Duncan, with the consent of the Etablissement de Dion-Bouton, of Puteaux, France, agrees to assign to the company the benefit of his agreement with the said Etablissement, and to carry on the business of manufacturers, repairers, importers and exporters of and dealers in motor-cars, carriages, cabs, omnibuses, vans, lorries, tractors, cycles, ships, launches, boats, aircraft, and other public or private conveyances, electrical and general engineers, etc. The subscribers (each with one preference share) are: T. C. King, Strathspey, Regent's Park Road, Finchley, N.3, solicitor's clerk; R. C. Heddle, 136, Osborne Road, Forest Gate, E.7, law typist. The first directors are: H. O. Duncan, 21, Margaret Street, W.1; H. W. Hillman, Milford, High Road, Whetstone; H. K. Rodwell, 52, Dartmouth Road, N.W.2; K. D. Wadia, 2, Avenue de Bois de Boulogne, Paris; and J. B. Clarkson, 21, Templars Avenue, Golders Green, N.W. Registered office: 16, Great Marlborough Street, W.1.

AEROPLANE ELECTRO PLATE ART METAL CO., LTD.—Private company. Registered May 5th. Capital, £1,000 in £1 shares. Manufacturers of and dealers in aeroplane novelties, and all kinds of electro-plate, art metal ware and fancy goods, etc. Agreement with C. Murtha. The subscribers (each with one share) are: C. Murtha, 86, Waterloo Road, Smethwick, aeroplane worker; G. F. Sansom, 20, Ellen Street, Brookfields, Birmingham, manufacturing jeweller. First directors: C. Murtha, G. F. Sansom, and H. J. Walker. Registered office: 17, Ellen Street, Brookfields, Birmingham.

COMMERCIAL RAPID DELIVERY SERVICE, LTD.—Private company. Registered May 6th. Capital, £10,200 in 10,000 preference shares of £1 each and 4,000 ordinary shares of 1s. each. Carriers by land, air, and water, etc. The subscribers (each with one ordinary share) are: A. B. Horsley, Oval Grange, West Hartlepool, merchant; W. A. Dutton, 82, Bishop's Mansions, Putney, S.W., advertising consultant. First directors: A. B. Horsley, W. A. Dutton, E. A. Wodehouse, 51, Baker Street, W., and H. W. Stirling, Lyndhurst, Ascot. Registered office: 96A, Upper Richmond Road, S.W.

ENTENTE INDUSTRIELLE (ENGLAND), LTD.—Private company. Registered May 2nd. Capital, £1,000 in £1 shares. Bankers, capitalists, financiers, concessionaires, merchants, exporters, importers, commission agents, brokers, auctioneers' agents, underwriters, insurance agents and brokers, engineers, etc. The subscribers (each with two shares) are: B. Baines, 6, New Burlington Street, W.1, solicitor; F. C. Nestler, 166, Piccadilly, W.1, aeronautical engineer. First directors to be appointed by the subscribers. Registered office: 166, Piccadilly, W.

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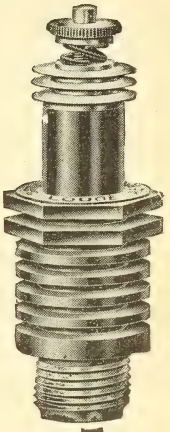
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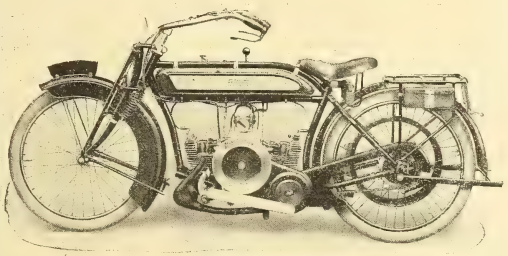


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AIRCRAFT IN PARLIAMENT

The following written answers were given on May 19th :—

ROYAL AIR FORCE.—DEMOBILISATION LEAVE.

Mr. GANGE asked the Secretary of State for War if men of the Royal Air Force who have been overseas for eighteen months without leave are denied upon demobilisation the three weeks extra leave granted to all other ranks under Army Instruction No. 851 of 1918; and, if so, if he will explain the reason for this treatment?

Major-Gen. SEELY: The leave referred to in Army Council Instruction No. 851 is not additional leave on demobilisation, beyond the twenty-eight days' demobilisation leave, but is leave granted to men retained to serve in the Force of Occupation who have completed their engagements. Similar conditions exist in the Royal Air Force.

REGENTS' PARK BUILDINGS.

Sir William PEARCE asked the Under Secretary of State to the Air Ministry if he will state what number of persons are now employed in the Air Force buildings, Regents Park; what is the nature of the work; and when this portion of the park will be vacated by them?

Major-Gen. SEELY: The number of persons at present employed by the Royal Air Force at Regents Park is 2332. They are engaged on the receipt, salvage, storage, and issue of aeroplane engines and their spares. Standard stocks are gradually being transferred to Ruislip, and it is hoped to complete this process by September 30th. The buildings and stocks not required to be retained will be handed over to the Aircraft Disposal Department of the Ministry of Munitions, the period of whose retention of them will, I understand, depend upon the time required for the disposal of the stocks transferred.

DOGS (IMPORT BY AEROPLANE).

Colonel WESTON asked the Under Secretary of State to the Air Ministry, in view of the spread of rabies in this country, the belief that dogs are being imported from dangerous countries by airmen, and the fact that outbreaks seem to have origin close to well-known aerodromes, if he will institute a Court of Inquiry to investigate the matter at Home and Continental aerodromes between which there is communication; will he furnish as far as possible to the proper authorities at home the number of dogs so imported during the last twelve months, the names of the airmen who brought them over, and the names and addresses of the receivers of such dogs; and will he state what steps are taken by the military authorities at the ports of embarkation abroad and disembarkation at home to ensure that dogs are not smuggled home, apart from the mere notification to troops and women who have been on service that it is forbidden.

Major-Gen. SEELY: The Air Ministry has no information which bears out the suggestion that dogs have been imported by aeroplane. The matter is one which has received, and will continue to receive, close attention. Inquiries as to the procedure at ports of embarkation should be addressed to the War Office.

ATLANTIC FLIGHT (MR. HAWKER).

Motion made, and Question proposed, "That this House do now Adjourn."

Captain ELLIOTT: I should like to call the attention of this House to a matter which is, I think, if not of great public importance, at any rate of great public interest. I should like to ask the Parliamentary Secretary to the Minister of Shipping, failing the presence of any other Government Minister on the Front Bench, if he has by this time received any information whatever as to the progress of Mr. Hawker in his very gallant attempt to uphold the supremacy of this country?

Colonel WILSON: When my hon. and gallant friend raised this question a short time ago, I took what steps I could to ascertain whether there was any information available which I could give. I am informed that there is no such information on this subject whatever. I am only sorry I am not in a position to say whether Mr. Hawker has arrived.

Captain ELLIOTT: May I express my deep disappointment, and may I, speaking to some extent, I think, in the name of the people of this country, put forward the most unsparing condemnation of the Government for its action in this matter? I think that the House in general, and certainly, I am sure, the country, feels that the Government has been lamentably remiss and desperately careless of the honour of this country and of the life of a very gallant gentleman

Mr. BALFOUR (Lord of the Treasury): I cannot allow that hon. and gallant gentleman has said to go without replies. I cannot see in what way he holds the Government responsible for the circumstances to which he has called attention. I can only promise this, that what he has said will be brought to the attention of the Government at the earliest possible moment.

Captain WEDGWOOD BENN: As the Lord of the Treasury has seen fit to intervene in the Debate, perhaps someone on the Government Bench will tell us what steps the Government took to aid Mr. Hawker, by reports or otherwise, across the Atlantic, or whether warnings were issued or incitement made to get this race run. The hon. and gallant Member (Captain Elliot), I am sure, voiced the feelings of every one in this country of high admiration for the splendid spirit displayed by this gallant airman, and perhaps the hon. gentleman, who naturally defends the Government, being there for that purpose, will explain what steps the Government has taken to assist in this enterprise.

Question put, and agreed to.

* * *

The following oral answers were given on May 20th :—

AIR MINISTRY (MOTOR CARS)

Lieut.-Col. W. GUINNESS asked the Secretary of State for War how many motor-cars are being used by the Air Ministry?

Major-Gen. SEELY: The number of cars used by the Air Ministry is forty-two. This includes cars used by branches of the Ministry housed in London but not in the Hotel Cecil

Lieut.-Col. GUINNESS: Can the figure be given for those in use by the Hotel Cecil?

Major-Gen. SEELY: I think it is either six or eight at the outside—about that. Besides that there would be about thirty. That will be about thirty-six about, for the staff of the Air Ministry housed at the Hotel Cecil.

Colonel ASHLEY: Could they not go by trains like other people?

Major-Gen. SEELY: Thirty-six seems a large number, but if you consider the number of officers which must be at the Hotel Cecil—I forget how many hundreds there are—it is evident that the vast majority of them go about like other people.

Col. WEDGWOOD: Is my right hon. friend aware that it was given in evidence before us that they required motor-cars because if they walked up and down the Strand they would be jostled by soldiers who would not salute them?

Major-Gen. SEELY: I am sure that cannot be given as a serious reason. But the whole question is being considered by the Committee of my right hon. friend the Member for the City of London. Every reduction possible will be made, but I must not be taken as assuming that it is desirable that cars be taken from officers of the Royal Air Force who have to administer large districts.

An HON. MEMBER: Will the right hon. gentleman inquire into the large number of cars used by civilian officials of the Air Ministry?

Major-Gen. SEELY: I am inquiring into that; as far as I can make out we have now come nearly to a minimum.

Lieut.-Col. GUINNESS: Can the right hon. gentleman say how many cars are used by the civilian members?

Major-Gen. SEELY: I must have notice of that

Major E. WOOD: Can the right hon. gentleman say whether there is any truth in the statement frequently made that these cars are used to carry ladies about?

Major-Gen. SEELY: No, Sir; I cannot believe that ever happens.

MR. HAWKER'S FLIGHT.—ADMIRALTY PRECAUTIONS FOR SAFETY.

Lieut.-Commdr. KENWORTHY (*by private notice*) asked the First Lord of the Admiralty what naval vessels were available on the South-West coast of Ireland before Mr. Hawker started on his flight to America; what steps were taken in case of an accident, and how many vessels are now searching for the missing machine.

The PARLIAMENTARY SECRETARY to the ADMIRALTY (Dr. Macnamara): As regards the first part of the question, the vessels stationed on the South-West coast of Ireland are as follows:—One flotilla leader, two destroyers, one sloop, all with reduced crews; two sloops on ferry service (one under rent, another at Portsmouth); sixteen motor launches, one patrol boat, four paddle vessels, ten trawlers, and five drifters. I may add that the motor launches are only suitable for inshore work, and the paddle vessels, the trawlers, and the drifters are continuously engaged in clearing the sea of mines.

As regards the second part of the question, no steps were taken before the commencement of the flight to deal with the situation which might have arisen any time during the past few weeks. As a matter of fact, however, during yesterday eleven trawlers were at sea off the West Coast of Ireland, and at 9 o'clock p.m. were carrying out a sweep to the southward from the vicinity of Blacksod Bay.

Further, when information reached us that the flight had actually commenced, we took such steps as were possible on the assumption that Mr. Hawker might be approaching this side. Yesterday afternoon orders were given for all available vessels on the Irish Command to proceed to sea as a precautionary measure, in consequence of which the following vessels proceeded to sea and were subsequently employed searching the sea: from Queenstown, two destroyers, one sloop, and one patrol boat (the leader, I may say, was at Kingstown); from Berehaven, three paddle vessels, from Galway, one tug; from Eagle Island, one tug. The motor launches were unable to proceed to sea on account of the state of the weather. All these vessels are still at sea searching that area off the West Coast of Ireland which lies between the main shipping routes to the North and South of Ireland.

I think, perhaps, I may add an explanation of the circumstances which led to the report that Mr. Hawker had fallen into the sea somewhere about forty miles off Loop Head. The Admiral, Queenstown, received a wireless message that a Sopwith machine was down from the Castletown Wireless Station. Castletown received it from a French Station, and the presumption is that the French Station in question had intercepted, in fragmentary form, and misconstrued, the orders of the Admiral, Queenstown, to his ships carrying out the instructions from the Admiralty to which I have already referred.

Lieut.-Comdr. KENWORTHY: In view of the considerable time that seaplanes sometimes remain afloat, will the right hon. gentleman consider the sending of a flotilla of fast vessels—not trawlers or sloops, but destroyers—at the earliest possible moment to search the area in which this gentleman may be down.

Dr. MACNAMARA: I will put that to the naval authorities.

Mr. BOTTOMLEY: May we take it there is no news so far of this gallant airman?

Dr. MACNAMARA: So far as I am concerned, an hour ago when I left the office there was no news.

Major-General SEELY: There was no news ten minutes ago when I left the War Office.

* * *

The following written answers were given on May 20th :—

ROYAL AIR FORCE.—FATAL ACCIDENT (JURY'S VERDICT).

Mr. MADDOCKS asked the Under Secretary of State to the Air Ministry whether his attention has been drawn to the report of the inquest on Flt Serjt. C. W. Wright, Royal Air Force, on Thursday, May 8th, 1919, and to the verdict of the jury that his death was due to the collapse of his aeroplane owing to the use of wood unfit for use in aeroplane construction, and that the employment of such wood was due to the criminal negligence of some person or official at present screened by the Department, and whether he is prepared to disclose the names of the person or persons responsible for passing the aeroplane as fit for use.

Major-General SEELY: My attention has been drawn to the verdict given by the jury in the sad case referred to by my hon. friend, and I have given the most careful consideration to it. The expert advisers of the Air Ministry on accidents have made the fullest inquiry into the cause of the accident, but it has not been possible to decide with certainty on the cause of the breaking of the wing. They do not incline to the view that the cause of the accident was defective wood, but even assuming that that was the case, one cannot be certain that inspection will disclose interior defects in a spar. The question of the right moment of dryness of wood is a highly technical one, on which experts differ, our own standard of humidity being nearly double that specified in America. With regard to the last part of the question, I have placed all papers and information in our possession at the disposal of Sir Charles Mathews, Director of Prosecution, for his consideration.

AIRCRAFT WORKS, WINDSOR.

Mr. TYSON WILSON asked the Under Secretary of State to the Air Ministry whether it is intended to complete the aircraft works at Wendover, Bucks; and, if so, will he explain why the contractors are not supplied with the plans necessary for carrying on the work

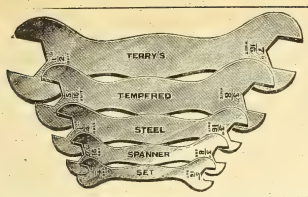
Major-General SEELY: The present intention is to complete these works, and the contractors have all the plans necessary to complete the work on which they are now engaged.

HAWKER-GRIEVE ATLANTIC FLIGHT.

Lieut.-Commdr. KENWORTHY (*by Private Notice*) asked the First Lord of the Admiralty how many additional vessels have been sent to reinforce the ships of the Irish Command in searching for Mr. Hawker's machine.

Dr. MACNAMARA: One flotilla leader and eight destroyers have been sent out.

Capt. W. BENN: Have any seaplanes been sent—a much more suitable way of searching?



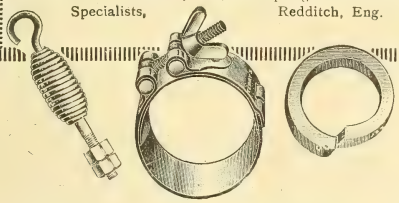
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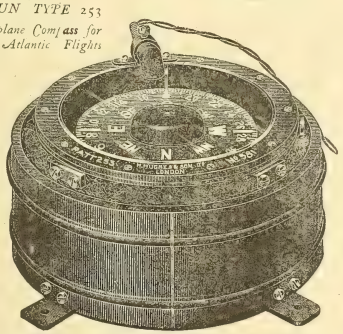


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Dr. MACNAMARA: I cannot say I shall have to inquire.

Lieut.-Col. W. GUINNESS: May I ask whether the responsibility for the tragedy does not really rest with those who, by organising prizes on a competitive instead of on a qualifying basis, encouraged Capt. Hawker to fly in bad weather and without adequate preparation. [Hon. Members: "Quite right!"]—and will the right hon. gentleman——

Mr. SPEAKER: The hon. and gallant Member can hardly expect an answer to a question like that without giving notice.

* * *

The following written answer was given on May 22nd:—

ATLANTIC FLIGHT.—GOVERNMENT ASSISTANCE.

Lieut.-Commdr. KENWORTHY asked the First Lord of the Admiralty whether naval assistance will be given and organised beforehand if, and when, a British citizen again attempts to fly the Atlantic.

Dr. MACNAMARA: I am glad this question has been put. It enables me—and this is most desirable in the interests of all concerned—to make perfectly clear the fact that it is quite out of the question to organise naval assistance beforehand if, and when, a British citizen again attempts to fly the Atlantic. It would not have been possible, if sought, in connection with the recent flight. It will not be possible in any future flights.

The views of the Government were expressed in a communiqué issued on Tuesday night, and it is unnecessary for me to repeat them, except to call attention again to the many and heavy obligations of the British Navy in many waters.

I wish, however, to make it plain that the Government did not, and could not, accept responsibility of any kind for private enterprises which were not under their control.

The efforts made, therefore, by the Admiralty were not in any sense a belated attempt to give protection which should have been arranged for earlier, but were the spontaneous efforts to do what was possible to save the lives of the two very gallant gentlemen who had made this attempt.

ROYAL AIR FORCE.—EMERGENCY RATIONS.

Capt. ELLIOT asked the Under Secretary of State to the Air Ministry whether an official from the Air Ministry made up an emergency ration of 3,000 calories to last for forty-eight hours for Mr. Hawker; whether he is aware that this is inadequate even for one day; and whether he will ensure that more accurate information is supplied to any others consulting his Ministry.

Mr. PRATT: No official at the Air Ministry made up any emergency ration for Mr. Hawker, but detailed suggestions were made as to the amount of suitable food necessary for the flight. The suggested rations per man were equal to a heat value of 12,557 calories. The second and third parts of the question therefore do not arise.

FLYING BOATS (ORDERS).

Mr. MACQUISTEN asked the Under Secretary of State to the Air Ministry whether, at the outbreak of war, the Admiralty purchased a flying-boat of new and successful design by Mr. Norman Thompson, built by Messrs. White and Thompson (subsequently renamed the Norman Thompson Flight Company in 1918), a pioneer firm established in 1909; whether this design, developed in structural details, and ultimately known as Type N.T.2B., was ordered in repetition from other firms as well as the Norman Thompson Flight Company, and in April, 1918, was officially adopted by the Air Ministry as their standard naval instruction machine; whether, in 1915, the Admiralty placed an order with the Norman Thompson Flight Company for ten flying-boats of such size that the firm were compelled to lay out considerable money in additional buildings for their existing works; whether, for twelve months after these extensions were completed in May, 1916, the Government were aware that the firm were only able to work at about one-third full output owing to constant changes in design ordered by the Admiralty and shortage of orders, and whether in the autumn of 1916 the Admiralty refused to allow the War Office to place orders with the firm; whether, in June, 1917, the Air Board required the firm to again increase their works for the production of one of their designs of flying-boats (Type N.T.4A.), and subsequently agreed to advance £20,000 for new buildings; whether, after placing considerable orders in the autumn of 1917 for N.T.4A. flying-boats, the Air Board cancelled those orders in January, 1918, and gave no new orders until May, 1918, after the appointment of a receiver for debenture holders; whether an urgent letter from Mr. Norman Thompson, dated July 26th, 1918, addressed to the Air Minister, asking him to redress the situation created by the above actions of the Admiralty, War Office, and Air Ministry, though formally acknowledged, has never been answered; and whether the Aircraft Finance Department of the Ministry of Munitions in October, 1918, refused the recommendation of the Lubbock Committee of the Treasury to pay off the debentures issued to Messrs. Cox and Company as security for advances and re-vest the control of the company in the directors?

Mr. PRATT: The answer to the third part of the question is that boats of the type referred to were used, not exclusively, but in conjunction with other types for seaplane instruction. I am making inquiries in regard to the letter mentioned in the penultimate portion of the hon. Member's question, and will communicate with him. Of the remaining parts of the question, the first, second, fourth, fifth, and sixth would appear to be for the Admiralty; the seventh, eighth, and tenth for the Ministry of Munitions.

DEMOBILISED FLIGHT CADETS (HONORARY COMMISSIONS).

Mr. F. C. THOMSON asked the Under Secretary of State to the Air Ministry why flight cadets who were demobilised between the date of the Armistice and February 15th, and were given no option in the matter, should not be granted honorary commissions, while those who have been demobilised since February 15th have been granted honorary commissions.

Mr. PRATT: Honorary commissions will be granted to cadets who were demobilised before February 15th.

ATLANTIC FLIGHT (MR. HAWKER).

Motion made, and Question proposed,

"That this House do now adjourn."—[Mr. Baldwin.]

Captain WEDGWOOD BENN: I should like to take this opportunity of asking the Under Secretary for the Air Ministry whether he has any news of Major Hawker; and, secondly, can he give the House some account of what assistance was rendered to Major Hawker by the Air Ministry?

Personally, I am sure that the Air Ministry showed itself very helpful in this matter, but we should like to know what assistance was rendered in the way of information as to weather and winds, and more particularly as to facilities for the reception of wireless messages which Major Hawker might have sent, and for sending which his machine was equipped.

The next point—an important point, and more urgent—is to ask the Under Secretary whether he will tell us what steps the Air Ministry, in conjunction with the Admiralty, has taken since the presumed disaster to Major Hawker, to assist in the rescue of this very gallant airman?

The UNDER SECRETARY OF STATE FOR AIR (Major-General Seely): I deeply regret to say that, up to a late hour, we have had no news of Major Hawker and Commander Grieve, who made this most gallant attempt to cross the Atlantic. There is always a possibility that they may have been picked up by some passing vessel not fitted with wireless.

Therefore, there is still some hope, but to a few minutes ago there was no news. With regard to the question as to what steps we took beforehand, as soon as we knew that any competitors were ready—although this, of course, was in no sense a Government enterprise, as I stated in this House—the Air Ministry took the view that they should enjoin caution upon all concerned rather than in any way encourage them to this most gallant and hazardous enterprise—we appointed an officer to be on duty night and day to apprise the necessary persons the moment the flight was commenced.

In accordance with the plans we had made, yesterday the officer apprised the Admiralty, who, I would like to say, throughout this business have given every assistance in their power. Short of stringing boats across the Atlantic, which, with its 2,000 miles of northern sea, would have been an almost impossible venture—the ships are not available—the Admiralty did everything in their power to make this hazardous enterprise less dangerous.

We informed the Marconi Company and also the Admiralty. The wireless stations sent messages to every ship on the route, giving the time of departure, the name of the aircraft that had started and the code word previously arranged, and urged upon all ships to look out for wireless messages and also to look out for the airmen.

The preliminary steps taken, about which my hon. and gallant friend asked me particulars, were to furnish every possible information with regard to the weather and all meteorological information that was available, and to furnish all assistance with regard to instruments. Whatever instruments they wanted for the purpose we enabled them to secure. We warned beforehand all vessels to be on the look-out for this prearranged signal.

Captain BENN: Was not a wireless communication made by Major Hawker, and, if so, by whom was it received?

Major-General SEELY: I was saying that we made all the arrangements we could beforehand. My hon. and gallant friend and the House will be much more interested to know that I think we took every possible step in connection with the Admiralty short of putting a large proportion of the Fleet on the millions of square miles of sea involved in an enterprise of this kind.

My hon. and gallant friend wants to know if any message was received. No message, so far as we can ascertain. I have been in consultation with the Lord quite recently. It is quite possible that in dropping the under-carriage Major Hawker and Commander Grieve may have injured their wireless installation. That is one explanation why no message of any kind has been received.

The explanation given by the Financial Secretary to the Admiralty this afternoon is probably the reason why a message was received last night purporting to show that these gallant men had fallen into the sea not far from the coast of Ireland.

My hon. and gallant friend asked me what steps had been taken since it was known that a start had been made and there was reason for anxiety. Yesterday afternoon the available vessels at Queenstown and others from the North of Ireland started out to explore the sea.

Since then more vessels have been sent, and although this is not a Government enterprise, and we cannot undertake, with the manifold obligations which the Fleet has to fulfil and the small number of vessels which are therefore available to quarter the sea. As a general rule, every ship of a swift nature has been sent during the last few hours on the chance of finding this most gallant man, who for the first time has dared to attempt to cross the Atlantic.

Captain BENN: Were any aircraft sent?

Major-General SEELY: I am glad my hon. and gallant friend has asked me that question, because last night, when I heard the news, which unfortunately proved to be erroneous, that Major Hawker had fallen into the sea, I went at once to see the First Sea Lord, and heard from him what measures had been taken, and, in consultation with him, I directed the aeroplane squadron which of course was there all ready, to place themselves under the orders of the Admiralty at Queenstown, with a view to quartering the sea, in order to see if they could catch sight of the airmen.

They tried to start last night, but there was a gale of wind and rain and fog, and they were unable to get away. Some tried, but could not see at all. Early this morning some of them started and flew over the sea in most desperately bad weather. They did their utmost, but without result. I think one may say everything possible has been done to get trace of these brave men, but so far without result. We can only express our fullest admiration for the astonishing courage of these brave countrymen of ours who have made this first attempt.

Mr. SEDDON: In view of this very important question that exercises the deepest concern of all Members of the House, I give notice that I will refer to the question of the beer supply to-morrow night.

Lieut.-Comdr. KENWORTHY: From what my right hon. friend has told us, I think the House will agree that energetic steps have been taken since the suspicion was aroused that Major Hawker and the gallant man who accompanied him had come to grief, but I do not think we are quite satisfied that sufficient steps were taken of a precautionary nature before the flight commenced.

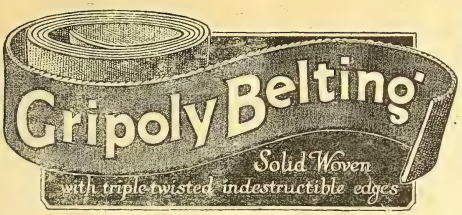
In answer to a question I put to the First Lord of the Admiralty this afternoon, we were informed that on the Irish coast there was one flotilla leader which was at Queenstown and two destroyers with reduced crews. There was also a number of motor launches and trawlers. These only vessels that were at all suitable for scouring or searching for aircraft that might have fallen into the sea are the flotilla leader and destroyers.

Trawlers have very inefficient wireless, and the outlook from them is very small. Usually they are commanded by very gallant men, but they are fishermen not used to operations of this character. They are a perfectly novel thing. This attempt to fly the Atlantic is an historical event.

Certainly it was undertaken by a private individual, but nevertheless it is a matter affecting the *esprit de corps* of the whole Empire. It is most desirable that the first man to cross the Atlantic should be a British subject. Under the circumstances, the least that we could have done would have been to have taken some steps to assist him.

We have in the Navy nearly 100 torpedo-boat destroyers, and I cannot accept the explanation that we had not more vessels available than two destroyers at Queenstown and one flotilla leader at Kingstown. Moreover, it is common knowledge now that we have installed in Ireland and in America a system—I think it is common knowledge now—which can fix the position of aircraft or any other surface vessel by cross-bearings and directional wireless, and it should have been possible for Mr. Hawker or any other airman attempting this perilous voyage to have made at intervals a spark which could have been taken in by directional wireless.

We could then have had a plot of his direction across the Atlantic. This was done by the Germans in giving positions to the submarines that were coming over to attack us, and we might have organised our



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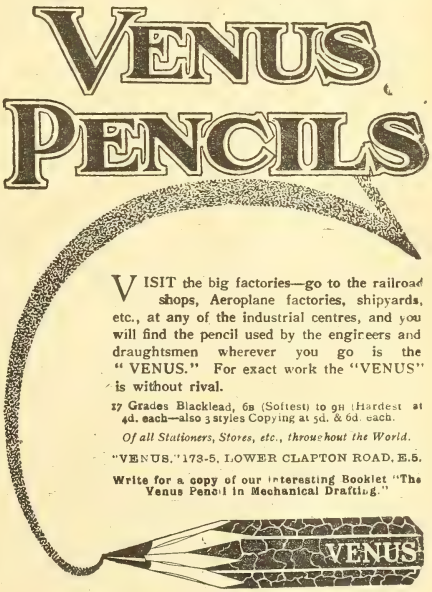


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wireless here in order to supply this assistance. That would have been of value to the airman, and it would have kept us advised of his whereabouts during the voyage.

I think that as regards wireless organisation and as regards the vessels to effect a rescue if required, or to guide him to land, we have been remiss, and I hope that the next time this flight is attempted, as I hope it will be attempted again and successfully carried out by an Englishman, that every possible assistance that we can give will be provided by both the Air Ministry and the Admiralty.

Captain ELLIOT: May I ask if the Air Minister can see his way to prohibit any further attempts to fly the Atlantic in the desperately hazardous conditions which exist at present? It is not fair that any gallant airmen should be lured to their death by the glamour of this great enterprise, with its desperate dangers, as, unfortunately, this trial has proved.

Major-General SEELY: No, sir. I do not think the Government would do right to take that step. I have given it, and I need hardly say personally, the most careful thought, and so have the Government, and it seemed to us not right to say that our fellow-countrymen should not take these daring steps, which, as it turns out on this occasion—I hope it may not be—has not been a success. Other feats which have seemed impossible of achievement have been done by men of our race.

It is not, I think, the function of the Government to say to men whom we do not control, and who are not in our service, "You shall not take these risks." I hope the House will endorse that view. Of course, I appreciate the feelings of the hon. and gallant gentleman who has made this suggestion.

Colonel PERCY WILLIAMS: Can the right hon. gentleman tell us what steps the American Government took to protect their airmen when flying from St. John's to the Azores? Had they a line of destroyers out which signalled from time to time the progress of the flight! I understand that that is so, and if it is so I really think we ought to know why our Admiralty did not do something of the same sort. It seems to me that unless our Government took every means in their power to protect these gallant airmen during this flight, which they knew was coming, they have been very remiss.

Major-Gen. SEELY: I am glad that question has been asked. Not only is the American Fleet freer to act than our own, not being so actively engaged, but, quite apart from that, the conditions of the flights were very different. These gallant distinguished airmen attempted a flight by direct route from America to Europe. The American enterprise, on which we intended to embark during the war as a test of flight, was a very much simpler thing. They were flying over more southerly seas to the Azores, a comparatively short flight, little more than half the distance, where the weather at this time of the year is much more certain and the flight could be begun in daylight.

It was, therefore, possible to have ships within sight to assist the man, and to enable him to see his way. That course was impossible in the case of the northern flight. In order to give the same help to the 1,860 you have to fly a great circle, which takes you in the north up amongst the icebergs. To have a string of ships across the Atlantic along the great circle from St. John's to Ireland would involve a tremendous undertaking—keeping the ships up amongst the icebergs waiting seven weeks for an opportunity until the conditions were favourable—which this House would never have endorsed and would have involved an expenditure amounting to millions of money.

It had been intended, if the Board had continued under the direction of Lord Weir, that we should do the same thing with the Porte flying-boat that the Americans attempted, but it was not considered wise to do it now and I think that was a right decision. But the problem is entirely different here. There was a shorter flight of 1,300 miles, which was done in daylight. The other was done across the great circle and a good deal of the flight from west to east had to be done at night, so that the course suggested could only have been adopted by an immense expenditure, and this is not so much a question of money but of the mechanical difficulties, and I have no doubt that the Government were right in saying that for this enterprise they could not ask the State to undertake this tremendous task.

Question put, and agreed to.

* * *

The following oral answers were given on May 21st:—

ROYAL AIR FORCE.—SURPLUS AEROPLANES.

Col. ASHLEY asked the Under Secretary of State to the Air Ministry whether he will offer to the Overseas Dominions and Colonies some of the surplus aeroplanes now in the possession of the Air Ministry with a view to their being used for postal and similar services.

Mr. PRATT: My hon. and gallant friend has asked me to reply. The question of the form in which assistance can be rendered to British possessions overseas for the purposes referred to by my hon. and gallant friend is under consideration and I hope to be able to announce a decision very shortly.

Col. ASHLEY: Is the hon. gentleman aware that the Dominions would appreciate, not only the gift, but the spirit in which it was offered?

Mr. PRATT: Yes, Sir.

CYPRESS ON AEROPLANES.

Mr. REMER asked the Under Secretary of State to the Air Ministry the name of the official responsible for allowing the use of cypress on aeroplanes; the date he left the service of the Air Ministry; whether he was dismissed or demobilised; and whether he is now able to state the names of his present advisers as to the use of suitable woods on aeroplanes.

Mr PRATT: As regards the reasons and responsibility for the temporary use of cypress for aeroplanes, I would refer my hon. friend to the answer given to him on May 1st. I am sending him to-day the names of the members of the Timber Committee of the Conjoint Board of Scientific Societies.

* * *

The following is taken from the "Times" of May 27th:—

On May 26th, General Seely, Under Secretary for Air, replying to Mr. G. Murray, said:—On Thursday last in Paris the Aeronautical Commission held its final meeting and agreed to a Convention relating to air navigation. On this Commission the five principal Powers are represented, as also Belgium, Brazil, Cuba, Greece, Portugal, Rumania, and Serbia. The seven smaller Powers enumerated have been appointed by the Supreme Council to represent on the Aeronautical Commission all the smaller Powers at the Peace Conference. The Commission will agree upon a covering report to be submitted to the Supreme Council. A few reservations by the Delegates of some of these States will be included in this report. I do not expect that these reservations will affect the usefulness of the Convention. The document is of 56 pages, embodying general principles, nationality of aircraft, and certificates of airworthiness, competency, and many other matters of great importance to air navigation. It is of great interest, and I hope to lay it on the table on an early date.

LEGAL BLUNDERS.

What do you think of the new Regulations? The "Imp" does not think. He knows that they contain at least two bad blunders and a host of minor imperfections. Make that good? Certainly.

(1) The Regulations make all parachuting illegal.

(2) The Regulations are self-contradictory about the three zones at aerodromes.

PARACHUTING IS ILLEGAL.

(1) Regulation 5, sub-par (2): "No person in any aircraft shall" (d) "drop or cause or permit to be dropped from the aircraft any article except ballast," i.e., fine sand or water. Under what authority are newspapers and other articles and persons being dropped from aircraft supported by parachutes or otherwise? Did Mr. Churchill intend to prohibit this, or is it a blunder?

SELF-CONTRADICTORY REGULATIONS.

(2) The draftsman or draughtsman of the Regulations does not know his left from his right. If the reader will turn to Schedule VII, Rules 40 and 42, and the sketches said to illustrate the latter, he will see that this is so. The right-hand zone "looking up wind" is the taking-off zone in the text and the landing-zone in the picture, and conversely with the left-hand zone. Who will be responsible for a crash caused by this blunder? Not

"THE LINCOLN IMP."

"And when he had said this he was silent, and so were we all; for, indeed, we were all astonished to hear so strange things so probably told."—BACON. "New Atlantis."

MEERING v. GRAHAME-WHITE AVIATION CO

The action in which Mr. Frank Clement Meering sued the Grahame-White Aviation Company for damages for alleged false imprisonment and malicious prosecution was concluded last week.

Mr. Holman Gregory, K.C., Mr. J. G. Hurst, K.C., and Mr. Bertram Long appeared for the plaintiff; and Sir Edward Marshall-Hall, K.C., Mr. H. H. Curtis Bennett, K.C., and Mr. Ellis Hill for the defendants.

The plaintiff said that in 1916 he was sent by his father to the defendants to learn flying. His father paid £100 premium. He took his pilot's certificate in October, 1916, and was then employed as an instructor of Army officers in flying, etc.

In 1917 he (the witness) conceived the idea of inventing an aeroplane which would be useful in warfare, and he made designs for it. The designs were complicated. Mr. Brakenridge, the manager of the flying school, knew that he was engaged on this work. When his drawings for the design were completed he got to work to make the aeroplane. The work was being done at a friend's garage in Essex, and the same friend financially assisted him. In order to get materials for the construction he saw Mr. Liddle, who was in the regular employment of the defendants.

He wanted sheet brass and other raw material, which could not at that time, owing to the war, be procured in the open market. Mr. Liddle said that he would inquire, and, a couple of days after, he told him that it would be all right, and he (the plaintiff) could get the materials from the chief storekeeper, Mr. Martin.

The goods were handed to him by the various under-storekeepers of the defendants. He got delivery by presenting a requisition to the under-storekeeper written out by Mr. Martin for the specific articles. His father gave him a cheque on December 31st for £11 14s. 1d. to pay for the goods.

Mr Claude Grahame-White said that he was the chairman and managing director of the defendant company. He produced a plan of Rose Cottage, where the plaintiff lived. He said that the distance of the cottage from the aeroplane sheds was 385 yards. During the war the company was doing a great deal of work for the Government, and it employed more than 2,000 persons. There were many cases of loss of the stores and goods, and much petrol was stolen. Hicks and Prudence, the police, reported loss of petrol to him on many occasions.

On January 26th, 1918, one of the company's police made a report to him, and he communicated with the Metropolitan Police at Hendon. Mr. Summerfield, a pilot in the aerodrome school, made a written report on January 28th.

He did not know that it had been decided to arrest the plaintiff. He left the whole matter to Mr. Hutchings. The plaintiff was arrested on February 5, and Mr. Martin was arrested later.

The hearing of the case lasted six days, and on May 23rd the jury gave their finding in favour of the plaintiff.

His Lordship ruled that the defendants had arrested and prosecuted the plaintiff without reasonable and probable cause, and he entered judgment for the plaintiff for £1,700.

His Lordship ordered that £1,500 should be paid to the Public Trustee to be held by him until the plaintiff became twenty-one years of age; that £200 should be paid to the plaintiff's father (his next friend in the action) for the costs which he had paid in his son's defence in the criminal Courts, and that the costs of the action should also be paid to the plaintiff's father.

On the application of Mr. Ellis Hill, his Lordship granted a stay of execution pending appeal on the following conditions:—The £1,700 to be paid to the Public Trustee within ten days; the costs in the action to be taxed and paid to the usual undertaking by the plaintiff's solicitors to return should the appeal be successful; notice of appeal to be given within fourteen days.

THE SHEEP AND THE GOATS.

By "The Snipe."

All of us know the slackers in uniform. They swarm in clubs to-day, and talk of the future of the R.A.F. They usually wear slacks in the morning, to show that they are no longer under the severe discipline of war-time, and they are slackers because they remain in a service that no longer requires them.

There is a grave danger that many of these slackers will remain and take the place of better men who do not desire to live at the expense of their country. The better class of R.A.F. officer appears to be getting demobilised rapidly.

The Right Stuff.

One has met literally hundreds of young well-educated pilots and observers who have seen service on all the fronts and who in many cases have been decorated, yet have declined to apply for permanent commissions merely because no effort whatever has been made to induce them to remain in the R.A.F. Many of these are young men who at the outbreak of war were just entering upon their professional careers with the brightest of prospects. They have proved themselves the right stuff, and they would be the stiffening that the post-bellum R.A.F. requires, but they were kept waiting so long for a decided policy to be announced that they can hardly be blamed for leaving the service when one takes into consideration their prospects in civil life.

As to the promising material we have lost owing to the treatment flight cadets have received, one need only point to the numerous letters that have been published in The Aeroplane.

The method of examining officers for permanent commissions may be reasonable, but one would like to see the right officers make applications for them. Too many of the best seem to be over-nourished with the Force.

Composed of All Classes.

Our war-time R.A.F. was a remarkable organisation; it had many faults, and a few inherited virtues. The type of officer had not been standardised. One could meet all classes. One might have the good fortune to serve under an O.C. whose father and mother were gentlemen, as the Irishman said, or one might serve under a colonel who would boast before the sergeant-major that he had been sweeping out a garage before the war—an actual incident, by the way. One has no prejudice against garage sweepers, but this one lacked tact.

The uninitiated are apt to wonder why some officers were promoted. Those who were behind the scenes know. In politics the same process is called "kicking a man upstairs," and one believes that certain people who have been annoyingly fond of asking awkward questions in the House of Commons have in the past been promoted to the upper House as the simplest method of getting rid of them.

Inefficient Officers.

A C.O. of a unit who found himself saddled with an inefficient officer could not give him a month's pay in lieu of notice and carry on with the war. True, he might put in an adverse report, but that was a troublesome proceeding, as it was probable that the officer's previous C.O. had given a very favourable report in the hope of getting rid of him permanently. If some reports were favourable and some adverse there would be inquiries, and it is probable that the C.O. who told the truth would be informed that if he could not get good work out of his officers it was evident that he lacked the ability to command.

The simpler method was to recommend the unwanted officer for some job that carried promotion in another unit.

One remembers a story told years ago about two astute financiers, one British and one American.

The Britisher went to New York with the avowed purpose of finding a general manager who could introduce American business methods into England. He paid a visit to the magnate of New York and asked if he had on his staff a live man capable of handling a ten-thousand-a-year job. The New Yorker said he was flattered by being asked, and that the British Napoleon of Finance might have any man on his staff except X——.

The Britisher pondered, asked X—— to dinner, engaged him, at a colossal salary, on a ten-year agreement, and laughed in his gold-linked sleeves. But he found that the Daylight Saving Act would have to be amended before he could get the better of the New Yorker, who, when he heard the news, merely remarked that he had been trying "to freeze out X—— for years."

Getting Rid of a Dud.

This story well illustrates the Service method of getting rid of a "dud" and fully explains why certain officers went over the heads of others so rapidly. The efficient ones often found that there was many a slip 'twixt the sub and the pip.

The Army, being more experienced than the R.A.F. in the art of wangling, naturally hailed the flying service as a glorious dumping-ground, so we had hundreds of attached officers in downy jobs. They knew nothing of the work of the R.N.A.S. or R.F.C., so some of them tried to justify their existence by endeavouring to make the military side of the Service predominant.

At the time of the Armistice we had an amazing organisation which, in spite of enormous frictional losses, worked after a fashion. The most striking feature was the way round pegs found their way into square or at least hexagonal holes.

The natural desire for promotion was the cause of this, coupled with the fact that the number of pips or oakleaves in a unit was limited by the establishment. A few examples will show the working of the system.

Misfits.

Lieut. Y——, after spending two years in France as an observer, is sent home for ground duty only and for promotion. He may be given a job as adjutant on a station the establishment of which only provides for a lieutenant in that position. He may prove a good adjutant or a bad one. That is not the question. In course of time he may learn how five hundred different forms have to be filled up, and remember without the aid of Pelmanism which should be submitted in duplicate, which in triplicate, and which in quintuplicate. He may know all about W.R.A.F. regulations. Again, this does not matter. He cannot be promoted unless he is posted to another unit.

But one day a vacancy occurs which carries promotion to captain. Possibly the opening is in, say, a meteorological branch. Lieut Y—— is not sure whether meteorology means the scientific study of beef or astronomy, but the chances are that he will take the job if he has the opportunity, and by the time he has learned his duties at this station and is beginning to be useful there may occur a vacancy at some other branch which carries promotion again.

Miraculous Ignorance.

Thus one found misfits everywhere. One knew mechanical transport officers who to the end of their service did not know if a contact-breaker was part of a carburetter or of the differential. One knows others who knew so little of the properties of metals that they thought the best way to retrieve wiring plates and such fittings was to burn a crashed machine and pick the metal parts from the embers.

One knows that there were many misfits in all departments. There was a rumour, which may or may not be true, that a contract had on one occasion to be placed for many thousands of cold chisels, and that the inspired person who handled it specified that the chisels should be "double-ended."

One also heard of a certain officer who in early days had to make some inquiries with regard to K. B. winches and who had an idea that a winch was "some kind of spanner." Consequently he sent inquiries to a manufacturer of tools.

These stories may be apocryphal, but they illustrate a state of affairs that existed.

Shall we now see a change for the better? One has doubts, because wherever one goes one hears that the good officers who really did assist the Service are leaving it. Many of these were qualified for their work by many years of experience before they joined either the R.N.A.S. or the R.F.C. Naturally, owing to their qualifications they have no difficulty in finding good opportunities in civil life.

Looking for Strings to Pull.

But the less competent, who have no conspicuous ability in any direction, and who in the R.A.F. held infinitely better positions than they ever held or are likely to hold in civil life, will naturally pull every possible string that has a permanent commission at the end of it.

Marshal Foch has repeated that the principles of war are unchanging; the laws of human nature, and especially of official human nature, are equally immutable.

Is it of any use to blind ourselves to the facts that every day we are losing good officers, and that we see others far less capable clinging onto their R.A.F. appointments with both hands because in civil life they know they could find nothing so lucrative?

A Maze of Contradictions.

Many of the best could have been retained if an effort had been made to keep them. Instead they have been told that they might join the Army of Occupation, later that only a few would be selected. Again, that they might apply for permanent commissions, but that pay "would not necessarily be so good," then that it would be impossible to live in the R.A.F. without a private income. They have seen the abolition of acting rank and have immediately after seen many acting ranks confirmed. Is it surprising that, living in a world of rumours and contradictory orders many of the best have left the Service?

'Tis a problem that gives one furiously to think.

THE ACCIDENT TO THE TARRANT TRIPLANE.

It is with great regret that one records that the preliminary trials of the Tarrant "Tabor" Triplane ended in a fatal accident. The machine was brought out of its shed early on Monday morning, and with a crew of six on board began to taxi about the area between Jersey Brow and Laffan's Plain. The crew consisted of Capt. F. G. Dunn, A.F.C. (pilot), Capt. P. T. Rawlings, D.S.C. (General Manager of the Tarrant Aeroplane Department), Capt. T. M. Wilson (late of the Technical Department, Air Ministry), Lieut. J. Adams, O.B.E., D.C.M., (in charge of engines), and Messrs. Grosert and Edney, of the Royal Aircraft Establishment.

After doing several turns with the tail-skid on the ground the pilot increased his speed, and lifted the tail off the ground. Then, it seems, he opened out the two upper engines, which apparently pulled the machine over onto its nose. It slid for some yards on the nose of the fuselage, which then collapsed, so that the machine stood bolt upright on the leading edges of the planes

Capt. Dunn was severely injured, but was still alive on Tuesday. Capt. Rawlings died of his injuries soon after being admitted to hospital. Capt. Wilson was badly hurt and had to have an operation performed on him. The other three members of the crew were not severely injured.

The accident was of a kind which several people rather expected, and it might have been avoided by fitting leading wheels, in the manner of the Voisin, or D.H.3, or the early F.Es. But such leading wheels are now regarded as old-fashioned and unnecessary because of the skill of modern pilots, so the makers of the machine were probably justified in omitting them, although the weight of the wheels would have been justified in a purely experimental machine.

Nobody seems to be in the least to blame, for the whole affair was just a pure accident. Everybody will feel great sympathy for Mr. W. G. Tarrant, who must have spent many tens of thousands of pounds on the machine. This will be particularly so because Mr. Tarrant did not come into the Aircraft Industry as a business proposition, but because he wanted to bomb Berlin and believed that this giant triplane design was the thing to do it. It seems highly probable that he was right in his belief, and that if war had continued he would have attained his object, although much experimenting would have been necessary before the type was perfected.

Mr. Tarrant is a man of determination, and one gathers that he will proceed at once with the construction of the second machine, which is already partly made. One wishes him all success with it.

The Late Captain Rawlings.

Capt. P.T. Rawlings won his D.S.C. for the famous first raid on Constantinople, when he was engineer officer on the Handley Page machine which flew from Hendon to Mudros, and thence bombed the Turkish capital. Squadron-Commander Savory and Flight-Commander McClellan were the pilots, and one gathers that Lieut. Adams, who was in the Tarrant machine, was with Capt. Rawlings on the Constantinople trip as junior engineer.

Capt. Rawlings was a very able engineer and a capable business man who would have gone far towards success in the world but for his untimely end. His Service career speaks for his pluck and determination, and one needed only a short talk with him to be convinced of his mental keenness and intelligence. He is undoubtedly a great loss to British aeronautics. And he died in the service of the King as surely as if he had died in battle, for he died in an effort to produce a more effective weapon for use in future wars.

Capt. Dunn was one of the regular pilots at Hendon before the war, and, like the good sportsman he is, he enlisted in the R.F.C. immediately war began. He had a strenuous time in France, won a commission by sheer good service, and has for the past two years been testing every type of machine at Farnborough. All will wish him and Capt. Wilson a complete recovery.

The accident is wholly lamentable, but there is nothing in it which need discourage those concerned for the progress of aeronautics. One has known pupils to be killed while taxi-ing in the past, and one has seen many experimental machines wrecked before they attempted to leave the ground, so history has merely repeated itself.—C. G. G.

THE AIRCRAFT EXHIBITION.

Preparations are being made for the forthcoming Aircraft Exhibition in Leeds. It is understood that the Right Hon. Winston Spencer Churchill, Secretary of State for War and Air, has been invited by the Lord Mayor of the City to perform the opening ceremony on May 31st.

Since the Exhibition was at Newcastle many additional exhibits have been secured, including a flying-boat. There is still a certain amount of accommodation available for exhibits by civilian contractors. The charges are: for space 80 ft. by 15 ft., 100 guineas, for the duration of the Exhibition; charges for smaller spaces will be in proportion, but the minimum will be £20.

MORE GRIEVANCES OF CADETS.

The following letter has been received:—

Sir,—Having noticed that you have given space in your columns to the "grouse" of Flight Cadets, I am pleased to give you the facts and figures of a flagrant case.

When the R.F.C. called for young men from Service battalions in May, 1917, I applied for a transfer, and in November was sent to a Cadet Wing. Two months later, I was sent to a School of Military Aeronautics, and after qualifying, was recommended for a commission, and sent home "pending gazetting" in March, 1918, to purchase officer's military outfit to the amount of £50.

After being at home three weeks, in which time the R.A.F. was inaugurated, I received orders to report to a Training Station as a "Flight Cadet" on April 13th, 1918.

For 10 months I was training as a long-distance night-bombing pilot, and several times was allocated to the "Station Pool," through bad organisation, although I was the first pupil in the station.

I graduated "A" in August, 1918, just too late to receive a commission, and, on the signing of the Armistice, flying became so slack that I did not graduate "B" until February 7th, 1919, although I had commenced night-flying in October, 1918.

On March 13th, 1919, I was demobilised compulsorily as a "trained" Flight Cadet (Hon. Sec. Lieut.), but on making claims for £50 allowance, was forwarded F.S. Form 751, in which the grants are (i) £38 10s. to Flight Cadets who graduated "B" before Dec. 31st, 1918; (ii) £23 10s. to other Flight Cadets; (iii) £35 to Cadets!

After a great deal deal of trouble in obtaining duplicated and receipted bills I made claims for (i), on account of my extraordinary position, but was told that I could only claim (ii) as I graduated "B" later than Dec. 31st, 1918. Yet Colonial Flight Cadets receive £50.

The following figures show the pecuniary position:—

(a) Receipted bills, £30 6s.; (b) unpaid chit on Cox's, £13 18s. 6d.; total expenditure, £44 4s. 6d. Allowance (i), £38 10s.; remittance (i.e., allowances, less Cox's chit), £24 11s. 6d.; deficit (i), £5 14s. 6d. Allowance (ii), £23 10s.; remittance (i.e., allowance (ii), less Cox's chit), £9 11s. 6d.; deficit (ii), £29 14s. 6d.!!

What gratitude for services rendered! The Colonials may have done good work, but have not Englishmen?

"BRITISHER."

DEMOBILISED.

It is of interest to note that Mr. G. H. Davis, who has won such a high reputation as an artist on the "Sphere," was the man responsible for the production of the Aerial Instructional Diagrams which were issued to the Schools of Aeronautics, R.A.F., and proved such a success that deputations from all the Allied Governments came to inspect Mr. Davis' section at work.

Mr. Davis, now demobilised, has opened an office at Cromwell House, Fulwood Place, Holborn (just by the side of Chancery Lane Tube station), where he is engaged on posters for several aircraft firms. Also various officers in the Royal Air Force have commissioned him to paint their own particular "stunt" in the war, and these have been so successful that he hopes to develop this side of his work. There is no better souvenir of a man's fighting work than a picture, drawn under his own supervision and correct in every detail showing that gorgeous moment when he brought down his own particular pet Hun machine, and any officer who sees this note and decides to have a picture carried out, may be certain that the work will be well done by Mr. G. H. Davis, who, as one of our earliest and foremost painters of aircraft, knows his job.

A SALE OF AIRCRAFT MATERIAL

On June 2nd, at 2 p.m., there will be a sale of aircraft material at No. 1, Aircraft Salvage Depot, the Hyde, Hendon. By direction of the Disposal Board the items will be sold by auction by Norbury, Smith, and Co., of 5, George Street, Hanover Square, W. 1. On the previous Friday and Saturday the material to be offered may be viewed.

Fifteen complete aeroplanes in flying condition will be offered for sale. They are Avros, D.H.6s., A.Ws., and B.E.2, Cs., and Es., and it will be interesting to see at what figures these machines are knocked down.

Among other items are noted the following:—17,000 solid spruce struts, 14,500 hollow ditto, 3,000 solid ash struts, 3,500 hollow ditto, 2,200 ash skids, 1,000 two-blade propeller cases, 1,000 four-blade propeller cases, 150 ammunition cases with fittings, 30 metal-lined timber troughs, 42 fitters' and other benches, 650 yds. green Willesden canvas, 300 rolls fire and water resisting canvas, 400 acetylene ground flares; also large quantities of D.H.6 main planes, sea-plane wheels, rope and whipcord, copper, brass and other metal, oil and petrol tanks, radiators, scrap aeroplane timber, wings, etc.

Admission will be by permit only, which, together with the catalogues, may be obtained from the auctioneers, 5, George Street, Hanover Square, W.1.

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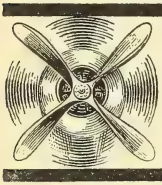
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Grey Rubber Washers 4¼ O/D. × 3⅜ I/D. × 1/16	1900
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NAVAL & MILITARY AERONAUTICS

FROM THE "LONDON GAZETTE."

AIR MINISTRY, May 20th.

R.A.F.—The following temp. appointments are made at the Air Ministry :—Chief of Air Staff.—Maj.-Gen. Sir H. M. Trenchard, K.C.B., D.S.O., vice Maj.-Gen. Sir F. H. Sykes, K.C.B., C.M.G., March 31st.

Director of Training and Organisation.—Col. (actg. Maj.-Gen.) P. W. Game, C.B., D.S.O., to relinquish the actg. rank of Maj.-Gen., and to be actg. Brig.-Gen. whilst so empld.

Director of Equipment.—Col. (actg. Maj.-Gen.) C. L. Lambe, C.M.G., D.S.O., to relinquish the actg. rank of Maj.-Gen. and to be actg. Brig.-Gen. whilst so empld.

Deputy Director of Personnel.—Col. H. P. Smyth-Osbourne, May 1st.

The following temp. appointments are made :—Brig.-Gen. (Staff)—Lt.-Col. (actg. Brig.-Gen.) C. L. N. Newall, C.M.G., A.M., March 17th, and to retain the actg. rank of Brig.-Gen. until April 30th

Colonel (Staff).—Lt.-Col. J. G. Hearson, C.B., D.S.O., and to be actg. Col. whilst so empld., May 22nd.

Staff Officer, 3rd Cl.—(P.).—Capt. L. M. Boddam-Whetham, May 1st, vice Capt. (actg. Maj.) C. B. Baker.

Staff Officers, 3rd Cl.—(Q).—Lt. H. C. Calvert, Feb. 2nd.—(T.).—Sec. Lt. (Hon. Lt.) G. A. Tilly, Feb. 9th, and to be actg. Capt. until April 30th, vice Sec. Lt. (actg. Capt.) A. B. Sharples (substituted for notification in "Gazette," April 24th).

FLYING BRANCH.—Sec. Lts. to be Lts. :—A. W. Davison, May 27th, 1918; A. Bentley, Dec. 26th, 1918.

The following relinquish their commns. on ceasing to be empld. :—Lt. G. A. H. Trudeau (Lt., N. Scotia R.), Dec. 12th, 1918; Sec. Lt. (Hon. Lt.) S. P. Wills (Lt., R.A.S.C.), Feb. 3rd; Lt. H. L. Symons (Capt., Can. Engrs.), Feb. 10th; Capt. G. L. Lumsden (Lt., Cent. Ont. R.), Feb. 16th; Lt. A. D. Walker (Lt., S. Lancs. R.), Feb. 20th; Lt. B. Donald, D.F.C. (Lt., Lond. R.), Feb. 21st; Sec. Lt. (Hon. Lt.) A. McBride (Lt., W. Ont. R.), Feb. 25th; Sec. Lt. (Hon. Capt.) J. E. Purslow, M.C. (Capt., Sask. R.), Feb. 26th; Sec. Lt. (Hon. Lt.) C. P. Holland (Lt., R.E.), March 14th; Lt. (Hon. Capt.) E. C. Clancey (Capt., Ont. R.), March 16th; Lt. A. E. Roodhouse (Lt., Can. Engrs.), March 19th; Lt. E. A. Coapman (Lt., C. Ont. R.), March 27th; Lt. (Hon. Capt.) H. C. E. Cherry (Glouc. R.), Lt. (actg. Capt.) W. J. A. Duncan, M.C. (Lt., Can. Rlv. Serv.), Lt. M. W. Waddington (Lt., Can. F. Art.), March 31st; Lt. (actg. Capt.) J. M. McKay (Lt., Quebec R.), April 4th, Sec. Lt. (Hon. Lt.) L. W. F. Agabeg (Lt., S. Lanc. R.), April 9th; Sec. Lt. (Hon Lt.) W. G. Waight (Lt., North'd Fus.), April 10th; Lt. (Hon. Capt.) A. E. Pickering (Capt., W. Ont. R.), April 30th; Lt. A. G. McCorquodale (Arg. and Suth. Highrs.), May 2nd.

Transferred to unempld. list :—Sec. Lt. L. B. S. Symons (Suff. R.), Feb. 6th; Sec. Lt. B. H. Robert, March 1st; Lt. J. E. A. Gray, March 7th; Sec. Lt. F. G. Cockburn, March 14th; Sec. Lt. A. Hogg, April 4th; Sec. Lt. D. A. Watson, April 8th; Sec. Lt. W. B. H. Eaton, April 9th; Sec. Lt. W. Williams, April 10th; Sec. Lt. G. H. Perring (Welsh R., April 12th; Sec. Lt. D. B. Foss, Lt.—(actg. Capt.) G. O. Lightbourn, April 13th; Lt. J. R. Smith, D.F.C., Lt. A. D. Staite, April 14th; Lt. R. T. Daubeney (R. West Kent R.), Sec. Lt. L. J. French, Sec. Lt. H. T. Sayer, April 15th; Sec. Lt. A. R. Collis, Sec. Lt. D. A. Hughes, Lt. W. G. Peters, Sec. Lt. E. C. Tasker, April 16th; Sec. Lt. G. C. Daly, Sec. Lt. F. C. Cathcard, Lt. A. Rothwell (Manch. R.), Sec. Lt. J. D. Scott, April 17th; Capt. C. G. Davies, M.C., Sec. Lt. M. E. C. Lake, Sec. Lt. E. T. Stead, April 18th; Sec. Lt. H. Buckner, Sec. Lt. H. E. Foster, Sec. Lt. W. Ward, Sec. Lt. (Hon. Lt.) J. B. Young, April 19th; Sec. Lt. A. L. B. Rees, Sec. Lt. D. W. Welch, April 20th; Lt. A. E. G. Robinson, April 22nd; Sec. Lt. L. W. Edmonds, Lt. W. E. Gibson, Sec. Lt. C. W. Gladman, Sec. Lt. (Hon. Lt.) J. B. Heppel, Lt. (Hon. Capt.) F. J. Haney, M.C., D.F.C., Sec. Lt. H. L. Stevenson, Lt. J. W. H. Scales, Sec. Lt. C. S. Trapp, Lt. E. McL. Watson, Lt. F. L. Wolf, April 23rd; Sec. Lt. R. P. O. Evans, Lt. B. Fletcher, Sec. Lt. R. D. Humman, Lt. A. L. Kenning, Sec. Lt. S. E. Sec. Lt. C. S. Wellendale, Sec. Lt. C. G. Wood, April 24th; Lt. J. Hawkins, April 25th; Sec. Lt. I. Duval, Sec. Lt. J. S. Swales, Lt.-Col. A. M. Wilkinson, April 26th; Lt. P. G. Allday, R.F.A., Lt. A. B. Harper, April 27th; Lt. F. V. Durkin, Sec. Lt. J. Newhill, April 28th; Sec. Lt. C. H. Allen, Sec. Lt. J. M. Donald, Sec. Lt. H. F. Gramel, Lt. G. Hagarty, Sec. Lt. R. W. Smith, Capt. A. Wood, April 29th; Sec. Lt. E. R. Atkinson, Sec. Lt. J. I. Boothroyd, Lt. L. D. Brown, Sec. Lt. E. H. Buxton, Sec. Lt. R. McL. Dunn, Sec. Lt. D. Etchells, Sec. Lt. J. Findlay, Sec. Lt. A. F. Grant, Sec. Lt. H. C. Maller, Sec. Lt. F. Randells, Sec. Lt. A. H. Ramaze, Sec. Lt. R. W. Willis, April 30th; Lt. J. D. Fisly, Sec. Lt. (Hon. Capt.) G. S. Grant, Lt. (actg. Capt.) J. B. Henry, Lt. G. T. Legge, Capt (actg. Maj.) C. F. M. Pickthorne, May 1st; Lt. W. Bamber, Lt. B. F. S. Cleburne, Capt. (actg. Maj.) A. W. Cassy, Sec. Lt. C. Davenport, Lt. J. D. Edge, Sec. Lt. F. R. Gibson, Sec. Lt. C. A. J. Goodfellow, Lt. O. Mansell-Moullin, Lt. R. H. Upson, May 2nd; Lt. S. B. Bradley, Sec. Lt. O. Child, Sec. Lt. E. Foley, Capt. (actg. Maj.) J. H. D. Grant, Sec. Lt. H. S. Greening, Sec. Lt. J. Stanley, May 3rd; Sec. Lt. (Hon. Lt.) H. G. Bloodworth, Lt. A. Connon, Sec. Lt. C. J. G. Etheridge, Lt. L. B. Gibson, Lt. M. D. Grainger Lt. S. M. Goldsmith, May 4th; Lt. C. F. Embleton, Lt. E. O. Fuller, Sec. Lt. E. Pidgeon, Sec. Lt. J. M. Robb, Lt. F. N. Smith, May 5th; Sec. Lt. H. M. Wallwright, Capt. G. S. Cole, M.C., Sec. Lt. D. M. Dee, Sec. Lt. H. Douglas, Capt. F. F. Fraser, D.S.C., Capt. A. Gammon, Lt. L. H. Plant, May 6th; Sec. Lt. S. C. Ashby, Lt. J. E. E. Bushell, Lt. E. R. Brown, Sec. Lt. E. G. De Carteret, Lt. S. B. Croyden, Capt. A. P. Dickie (Black Watch), Lt. E. W. Eneriss, Sec. Lt. A. W. Knowles-Brown, Lt. A. N. Martyn, Sec. Lt. L. G. Newman, Lt. W. F. Parke, Sec. Lt. J. S. J. Perry, Sec. Lt. H. Speed, May 7th; Sec. Lt. R. M. Allan, Sec. Lt. H. Bosher, Sec. Lt. C. G. Brennand, Sec. Lt. H. O. Beattie, Sec. Lt. N. A. D. Cowan, Sec. Lt. S. Cranston, Sec. Lt. J. E. Le-Court, Lt. C. C. Fenton, M.C., Sec. Lt. H. F. Feasel, Sec. Lt. H. W. Matthews, Sec. Lt. N. L. Neff, Sec. Lt. B. A. Noble, Sec. Lt. G. I. Packman, Sec. Lt. J. M. Patterson, Sec. Lt. C. W. Pethick, Sec. Lt. A. N. B. Odbert, Sec. Lt. R. Rigby, Second Lieutenant M. C. Sherwood, Second Lieutenant R. O. Standing, Sec. Lt. G. R. Steedman (W. Yorks R.), Sec. Lt. P. H. B. Wood, May 8th; Sec. Lt. T. E. Ault, Sec. Lt. T. D. Ross, May 9th; Lt. A. D. S. Davis, Lt. H. Erskine, Capt. J. A. Parsons, May 10th; Sec. Lt. G. S. Mottram, Sec. Lt. G. S. Walnole, May 11th; Lt. D. S. Ogilvie, May 12th; Sec. Lt. G. L. Parker, May 15th; Lt.-Col. H. I. F. Vates, May 15th. Capt. W. L. Samson, D.F.C., May 17th; Lt. C. G. Baird, Lt. A. Buckle, Sec. Lt. W. G. Campbell, Sec. Lt. B. G. Morgan, Sec. Lt. W. Schaefer, May 18th; Lt. H. B. Archibald, Sec. Lt. F. D. Cowan, Lt. J. L. Deslauriers, Sec. Lt. F. L. Pogue, May 19th; Sec. Lt. A. J. Adamson, Lt. N. B. Arbuthnot, Sec. Lt. S. J. Beveridge, Sec. Lt. H. A. Bradshaw, Sec. Lt. B. E. Bayne, Sec. Lt. F. C. Bennett, Sec. Lt. G. M. Butters, Sec. Lt. A. G. Baker, Lt. L. R. Brereton, Lt. E. C. Bromley, Lt. H. M. Brown, Sec. Lt. L. A. Brais, Lt. C. C. Boldrick, Sec. Lt. C. E. Beckman, Sec. Lt. H. Coyles, Sec. Lt. A. S. Corley, Lt. J. C. A. Cameron, Sec. Lt. H. L. Cullen, Sec. Lt. R. N. Cunningham, Sec. Lt. W. A. Dickson, Sec. Lt. E. B. Goodman, Lt. W. W. Gyles, Lt. (actg. Capt.) W. J. Mackenzie, Lt. J. G. Monaghan, Lt. (actg. Capt.) N. C. Millman, M.C., Sec. Lt. R. C. McLeod, Lt. G. B. McQuarrie, Lt. (actg. Capt.) G. C. Mackay, D.F.C., Sec. Lt. D. R. McLachrie, Lt. J. M. Purcell, Lt. L. M. Price, Sec. Lt. C. R. Parkinson, May 20th.

Maj. F. G. Small (Capt., Conn. Rgrs.) resigns his commn., and is permitted to retain the rank of Maj., May 21st.

The following relinquish their commns. on account of ill-health, and are permitted to retain their rank :—A. G. Bullock (contracted on active service), April 30th; D. W. T. Cain (caused by wounds), W. R. May, D.F.C. (contracted on active service), May 8th.

Lt. J. N. Kavanagh resigns his commn., May 21st.

Sec. Lt. (Hon. Lt.) J. W. Pryor relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain the rank of Lt., May 8th.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—H. J. Boyle, March 6th (substituted for notification in "Gazette," Jan. 10th); A. K. Barter (contracted on active service), D. Rose, May 8th; A. R. Coppin, May 9th.

Sec. Lt. J. B. P. Phillips is antedated in his appt. as Sec. Lt. (A.), Aug. 22nd, 1918.

The surname of H. Frew is as now described, and not H. Frow as stated in "Gazette," Dec. 6th, 1918.

The notification in "Gazette," June 14th, 1918, concerning Sec. Lt. T. Buchanan is cancelled.

The rank of Lt. J. A. Massey is as now described, and not Sec. Lt. as stated in "Gazette," April 25th.

The notification in "Gazette," March 28th, concerning Lt. O. Darlington is cancelled.

The notification in "Gazette," May 9th, concerning Lt. V. R. Blow is cancelled.

The notification in "Gazette," April 15th, concerning Lt. J. Burness is cancelled.

ADMINISTRATIVE BRANCH.—Lt. F. E. Lefevre, M.C., to be Lt., from (O.), May 5th.

Sec. Lt. N. Bucknall to be actg. Capt. without pay and allowances of that rank while specially empld., April 17th.

Sec. Lt. C. T. H. Page to be Lt., April 30th.

Sec. Lt. (Hon. Lt.) J. F. Lewis to be Sec. Lt., from (S.O.), and to be Hon. Lt., May 1st.

The following relinquish their commns. on ceasing to be empld. :—Sec. Lt. J. W. Squire (E. Surr. R.), Feb. 9th; Lt. A. P. Grage (Loyal N. Lancs. R.), Feb. 14th; Sec. Lt. W. R. Hutchins (R.F.A.), Feb. 24th; Lt. N. Hoole (W. Yorks R.), March 21st; Maj. H. L. Nixon (K.O. Lanc. R.), March 26th; Lt. E. W. D'Alton, M.C. (R.G.A.), April 10th; Capt. A. Coward (R.W. Surr. R.), April 22nd.

Transferred to unemplid. list :—Sec. Lt. (Hon. Lt.) (actg. Capt.) A. Duthie, March 10th; Lt. R. C. Allen (R.F.A., T.F.), March 22rd (substituted for notification concerning this officer in "Gazette," April 11th); Sec. Lt. M. H. Levy, March 24th; Sec. Lt. I. C. Hawkins, April 9th; Lt. S. H. Evans (S. Staffs R.), April 11th; Lt. (actg. Capt.) B. J. Fiske, April 15th; Sec. Lt. R. Corbett, April 16th; Lt.-Col. H. S. Ebben, April 17th; Sec. Lt. (Hon. Lt.) A. V. Collins, April 26th; Sec. Lt. R. K. Davis, April 27th; Sec. Lt. W. W. Blakemore, Sec. Lt. (Hon. Lt.) W. C. Van Eeden, April 28th; Capt. (actg. Maj.) L. E. Claremont, Sec. Lt. J. T. Howdl, April 30th; Maj. E. E. Clarke, May 2nd; Capt. S. Davenport, May 3rd; Maj. T. H. Hayes, May 4th; Sec. Lt. F. Denham, Lt. A. T. Freeman, May 5th; Sec. Lt. (actg. Capt.) W. W. Slinker, May 8th; Sec. Lt. J. R. O'Hagan, Lt. V. Phillips, May 9th; Sec. Lt. B. A. Doran, May 18th; Sec. Lt. M. Butt, May 20th.

Sec. Lt. (Hon. Capt.) N. McL. Kennedy relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Capt., May 8th.

The initials of Sec. Lt. T. A. Crowe are as now described and not F. A. as stated in "Gazette," May 2nd.

TECHNICAL BRANCH.—Maj. A. Levick to be graded for purposes of pay and allowances as Lt.-Col., Grade (B), from (S.O.), May 1st.

F. A. C. Hole is granted a temp. commn. as Maj., April 1st, 1918.

C. H. R. E. Raven (Lt., R.E., T.F.) is granted a temp. commn. as Capt., Grade (A), April 1st, 1918 (substituted for notification concerning this officer in "Gazette," March 4th).

Lt. (Hon. Capt.) F. Grave to be actg. Capt. whilst empld. as Capt., Grade (B), from May 22nd, 1918, to April 30th

Lt. (Hon. Capt.) F. Grave to be graded for purposes of pay and allowances as Capt., Grade (B), May 1st.

Lt. W. A. B. Probert to be Lt., Grade (B), from (Ad.), Nov. 7th, 1918.

Sec. Lts. to be Lts. with pay and allowances of that rank :—(Hon. Lt.) H. B. Lee, April 2nd, 1918; C. H. Boreham, Jan. 27th; M. C. S. Bowley, May 5th.

Sec. Lt. A. H. Hollingdale to be Sec. Lt., Grade (A), from (Ad.), Feb. 18th; Sec. Lt. W. Wilcock to be Sec. Lt., Grade (A), from Grade (B), May 13th; Sec. Lt. (Hon. Lt.) (actg. Lt.) F. H. Astle to be Sec. Lt., Grade (B), and relinquishes the actg. rank of Lt. on ceasing to be empld. as Lt. (and to be Hon. Lt.), April 24th.

Sec. Lt. T. H. Spence (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt., Grade (B), Sept. 4th, 1918.

Sec. Lt. (Hon. Lt.) E. H. Morriss (R.A.S.C.) relinquishes his commn. on ceasing to be empld., April 26th.

Transferred to unemplid. list :—Lt. T. L. Edwards, Jan. 30th; Sec. Lt. (actg. Lt.) R. C. Brown, Jan. 31st; Lt. G. A. Hill, Feb. 11th; Capt. W. Tod, March 9th; Capt. F. D. Williams, May 31st; Lt. F. W. Taylor, April 8th; Sec. Lt. J. F. Sheppard, April 9th; Capt. F. G. Hoare, Lt. G. H. Rice, April 12th; Capt. A. Haywood, April 14th; Maj. J. Findlater, M.C., Sec. Lt. L. T. K. Sanderson, Sec. Lt. R. G. Wills, April 16th; Lt. F. T. Wheatley, April 17th; Capt. S. T. Buckland, April 20th; Sec. Lt. T. Harris, Sec. Lt. (Hon. Lt.) (actg. Capt.) J. A. Hone, April 24th; Sec. Lt. (Hon. Lt.) H. L. Fordred, April 25th; Sec. Lt. (Hon. Lt.) J. L. Fin-

ney, April 26th; Capt. H. R. Spence, April 29th; Sec. Lt. J. France, Sec. Lt. F. C. Gibson, Sec. Lt. (actg. Capt.) H. J. L. Greatwich, Sec. Lt. C. Langman, Sec. Lt. W. A. Thicknesse, April 30th; Sec. Lt. B. Bess, Capt. T. A. Parker, May 1st; Sec. Lt. (Hon. Lt.) A. W. Cott, May 2nd; Sec. Lt. F. White, May 3rd; Sec. Lt. H. F. C. Beardwood, Lt. H. I. Bell, Lt. O. Fielding-Clarke, Sec. Lt. W. H. Parker, May 6th; Sec. Lt. H. C. B. Good, Maj. C. E. Prince, Lt. D. L. Stewart, May 7th; Sec. Lt. (Hon. Lt.) W. Archdale, Capt. C. D. Butler, May 8th; Capt. A. A. Allan, May 9th; Sec. Lt. (Hon. Capt.) J. C. Harrison, May 11th; Sec. Lt. J. H. McGee, May 20th.

The notification in "Gazette," Nov. 22nd, 1918, concerning Sec. Lt. (Hon. Capt.) F. Grave is cancelled.

MEDICAL BRANCH.—Transferred to unempld. list:—Capt. C. Dickson, M.C., April 24th; Lt. J. Wynne Yorke-Davis, April 26th.

DENTAL BRANCH.—Lt. R. C. T. Evetts is transferred to unempld. list, April 3rd.

CHAPLAINS BRANCH.—Capt. the Rev. J. H. Newell is transferred to unempld. list, May 10th.

The following temp. appointments Women's Royal Air Force, are made at the Air Ministry :—To be Dep. Comdt. whilst so empld. :—Asst. Comdt. Mrs. L. M. K. Pratt-Barlow, M.B.E., April 15th.

To be Asst. Comdt., 1st Cl. :—Administrator W. E. S. Mount-Batten, M.B.E., M.M., Dec. 15th, 1918.

To be Dep. Asst. Comdt. :—Administrator M. A. Thompson, M.M., Feb. 1st.

To be Asst. Comdt., 2nd Cl., whilst so empld. :—Administrator M. A. Thompson, M.M., March 21st.

The following temp. appointments, Women's Royal Air Force, are made :—To be Asst. Comdt., 2nd Cl. :—Administrator M. Moss, Feb. 1st.

To be Asst. Comdt., 2nd Cl., whilst so empld. :—Administrator M. A. Thomson, April 5th.

To be Dep. Asst. Comdts., with rank of Administrator whilst so employed, if not already holding that rank :—Dep. Administrator Mrs. J. C. Paterson, Nov. 4th, 1918; Dep. Administrator Mrs. A. Rathbun, Jan. 1st; Administrator M. T. Talbot, Dec. 30th, 1918; Dep. Administrator M. Drury, April 1st; Dep. Administrator A. M. Mackintosh, April 5th; Dep. Administrator Mrs. A. Hughes Gibb, April 26th.

Administrator E. Thomson relinquishes the appointment of Dep. Asst. Comdt. on ceasing to be so temp. empld., Feb. 5th.

ADMINISTRATIVE BRANCH.—Principal to be Administrator, sen., April 1st, 1918 :—Miss M. T. Talbot (W.R.N.S.), Nov. 25, 1918.

Deputy Principals to be Deputy Administrators, seny. April 1st, 1918 :—Mrs. N. Richards (W.R.N.S.), Nov. 6th, 1918; Miss M. M. Cottrill (W.R.N.S.), Nov. 6th, 1918.

Deputy Principals to be Deputy Administrators :—Miss E. K. Alexander (W.R.N.S.), Nov. 6th, 1918, seny. April 10th, 1918; Miss P. M. Ralston (W.R.N.S.), Oct. 31st, 1918, seny. May 6th, 1918; Miss M. Carnley (W.R.N.S.), Oct. 31st, 1918, seny. May 15th, 1918; Mrs. J. R. Lawrie (W.R.N.S.), Nov. 23rd, 1918, seny. May 15th, 1918; Miss M. McArthur (W.R.N.S.), Nov. 23rd, 1918, seny. June 28th, 1918; Miss D. E. Mellor (W.R.N.S.), April 23rd, 1918, seny. July 30th, 1918.

Asst. Principals to be Asst. Administrators, seny. April 1st, 1918 :—Miss E. L. Smith (W.R.N.S.), Oct. 31st, 1918; Mrs. A. Rathburn (W.R.N.S.), Oct. 31st, 1918; Miss M. S. Cole-Hamilton (W.R.N.S.), Oct. 31st, 1918; Miss M. Willis (W.R.N.S.), Nov. 6th, 1918; Miss N. H. Bell (W.R.N.S.), Nov. 6th, 1918.

Asst. Principals to be Asst. Administrators :—Misses A. E. Bullivant (W.R.N.S.), Oct. 31st, 1918, seny. April 20th, 1918; M. C. Ralston (W.R.N.S.), Oct. 31st, 1918, seny. April 20th, 1918; G. Bruce (W.R.N.S.), Nov. 6th, 1918, seny. April 20th, 1918; D. B. Gordon (W.R.N.S.), Oct. 31st, 1918, seny. May 18th, 1918; Mrs. K. L. Churchill (W.R.N.S.), Nov. 6th, 1918, seny. May 18th, 1918; Misses C. B. Collas (W.R.N.S.), Oct. 31st, 1918, seny. May 23rd, 1918; G. E. Newman (W.R.N.S.), Nov. 23rd, 1918, seny. June 15th, 1918; E. O'Sullivan (W.R.N.S.), Nov. 23rd, 1918, seny. June 15th, 1918; M. Woodward (W.R.N.S.), Nov. 23rd, 1918, seny. June 15th, 1918; M. K. Goodhand (W.R.N.S.), 31st, 1918, seny. July 15th, 1918; S. J. Tyler (W.R.N.S.), Oct. 31st, 1918, with seny. from July 20th, 1918; E. G. Hamer (W.R.N.S.), Nov. 6th, 1918, with seny. from July 20th, 1918; M. M. Hugh-Smith (W.R.N.S.), Dec. 23rd, 1918, with seny. from July 20th, 1918; H. B. Dornack (W.R.N.S.), Nov. 23rd, 1918, with seny. from Aug. 18th, 1918; G. M. Truscott (W.R.N.S.), Aug. 31st, 1918, with seny. from Aug. 18th, 1918; Mrs. A. Miles (W.R.N.S.), Oct. 31st, 1918, with seny. from Aug. 18th, 1918; Misses E. M. Wells (W.R.N.S.), Nov. 6th, 1918, with seny. from Aug. 18th, 1918; P. C. Barber (W.R.N.S.), Oct. 31st, 1918, with seny. from Aug. 24th, 1918; E. A. K. Abbott (W.R.N.S.), Dec. 22nd, 1918, with seny. from Aug. 27th, 1918; B. O. Brown (W.R.N.S.), Oct. 31st, 1918, with seny. from Sept. 7th, 1918; E. R. Gill (W.R.N.S.), Oct. 31st, 1918, with seny. from Sept. 8th, 1918; D. J. Forbes-William (W.R.N.S.), Nov. 20th, 1918, with seny. from Oct. 30th, 1918; E. Middleton (W.R.N.S.), Nov. 23rd, 1918, with seny. from Oct. 22nd, 1918; N. H. Frank (W.R.N.S.), Nov. 22rd, 1918, with seny. from Oct. 22nd, 1918; L. Hellaby (W.R.N.S.), Dec. 14th, 1918, with seny. from Aug. 24th, 1918.

Officer candidates to be Asst. Administrators :—Misses M. C. Cadman, N. A. M. Howard, Aug. 6th, 1918; P. L. Gate, Oct. 1st, 1918; E. M. Crawford, D. E. Westbrook, J. E. Williams, O. E. Whittaker, Williams, Oct. 28th, 1918.

Asst. Administrators to be Dep. Administrators :—G. Bruce, Mrs. A. Rathbun, Dec. 1st, 1918; A. M. Mackintosh, Dec. 16th, 1918; E. O'Sullivan, Dec. 30th, 1918; E. M. P. Grubb, K. E. Main, E. M. Smith, Jan. 1st; Mrs. G. L. Purves, Jan. 10th; P. C. Barber, Jan. 23rd; V. Dening, G. Lawes, the Hon. Mrs. E. Methuen, M. S. Norfor, M. C. Ralston, V. St. L. Winter, Feb. 1st; A. G. Jones, D. Moss, H. B. Womack, Feb. 10th; H. J. L. Fletcher, Feb. 17th; Mrs. G. T. Coyne, K. Gilmour, E. F. J. Simpson, Feb. 19th; Mrs. A. E. Balfour, I. A. Coombes, M. Holt, P. O. Legard, A. G. Moran, M. McCarthy, J. O. Ramsbottom, Feb. 20th; A. Dawson-Webster, Feb. 24th; F. Baker, J. Retallack, March 1st.

To be Administrators :—Asst. Administrator Mrs. W. M. Corbett, Feb. 11th; Dep. Administrator O. Cayley, Feb. 19th; Dep. Administrator I. M. Waistell, Feb. 24th.

To be Administrators whilst so empld. :—Asst. Administrator M. S. Cole-Hamilton, Jan. 14th; Dep. Administrator M. McArthur, Jan. 21st; Dep. Administrator M. E. Gemmell, Feb. 1st; Dep. Administrator F. L. Gauntlett, Dep. Administrator V. E. M. Gallagher, March 1st; Dep. Administrator E. O'Sullivan, Dep. Administrator H. M. Reid, March 22nd; Dep. Administrator F. M. Girdler, Dep. Administrator V. C. Guy, April 1st; Dep. Administrator H. P. Womack, April 11th.

Asst. Administrators to be Dep. Administrators whilst so empld. :—M. E. Clarke, Jan. 6th; M. C. Grantham, G. E. Newman, B. A. Turton, March 1st; M. Hallowell-Carew, March 8th; K. G. Mitchell, E. M. Renny-Tailyour, March 10th; J. V. Campbell, E. Ingram, G. Tighe March 11th; E. M. Morrison, March 13th; Mrs. N. A. M. Barnett, March 14th; Mrs. V. E. Carter, Mrs. M. Savage, March 15th; P. Brander, L. Hellaby, D. Hodgson, March 22nd; Mrs. M. Cookson, N. Lee, March 25th; E. A. K. Abbott, March 26th; M. Pearce, M. S. Cunninghame, M. F. Bradley, C. Bell-Cox, Mrs. E. M. Fuller, F. A. Laskie, R. Mahoney, E. M. Phillips, E. L. Smith, E. M. Williams, April 1st; E. M. Lovat-Fraser, April 8th; F. M. Cullen, April 10th; J. M. Smith, April 14th; F. H. Spinney, April 15th; K. M. W. Wernineck, April 17th; M. Peppercorn, April 23rd; M. H. Mackay, April 24th.

The following officers resign their appointments on account of ill-health :—ADMINISTRATORS.—A. N. Maltby, March 5th; Mrs. E. D. Hamilton-Hall, March 28th.

DEPUTY ADMINISTRATOR.—M. Hamilton, April 7th.

ASST. ADMINISTRATORS.—Mrs. A. H. Dashper, Feb. 12th; M. C. Wharry, Feb. 14th; G. M. Johnson, March 15th; M. D. S. Dance, March 28th; Mrs. J. Proger, April 8th; Mrs. A. F. C. Jones, April 19th.

The following officers relinquish their appointments at other own request :—Asst. Comdt.—Mrs. M. Moss, April 5th.

Administrators.—M. K. Fraser, Feb. 16th; Mrs. G. E. M. Kitto, Feb. 28th; Mrs. C. Campbell, April 5th; M. T. Talbot, April 29th.

Deputy Administrators.—K. Daniel, Feb. 24th; E. J. Edwards, March 10th; M. Kinross, March 31st; Hon. Mrs. E. Methuen, March 31st; J. S. P. Hickie, April 7th.

Asst. Administrators.—Mrs. I. W. Townshend, Feb. 10th; Mrs. L. W. Burns, Feb. 15th; E. Cumming, Feb. 17th; Mrs. J. W. Grant, Feb. 28th; Mrs. . F. Gibson, March 1st; B. M. Slipper, March 11th; H. D. Forman, March 17th; P. E. Wilkinson, March 18th; Mrs. A. Miles, March 19th; Mrs. A. C. Farrant, March 21st; D. E. Hume, March 27th; J. Retallack, E. M. Andrews, March 29th; Mrs. O. M. Wyatt-Pratt, March 31st; E. K. Knowles, April 1st; E. F. Ivatt, A. G. Pitty, April 2nd; Mrs. A. M. McGrath, April 7th; A. K. Crokett, April 24th; E. R. Powell, April 26th; N. E. Bonner Morgan, May 1st; Mrs. J. C. Martin, May 3rd.

MEMORANDA.—The following are granted the actg. rank stated against their names, with effect from May 1st :—

To be actg. Brig.-Gens. :—Col. F. R. Scarlett, C.B., D.S.O., whilst commdg. No. 12 Group; Lt.-Col. F. G. Willock, D.S.O., whilst in comd. of Blaudford and Halton; Col. E. A. D. Masterman, C.B.E., A.F.C., whilst specially empld.

To be actg. Cols. :—Lt.-Col. A. W. Bigsworth, C.M.G., D.S.O., whilst comdg. No. 19 Group; Lt.-Col T. D. C. Barry, C.B.E., whilst President of Invaliding Med. Boards.

To be actg. Lt.-Cols. :—Maj. B. R. Bickford, D.S.O., whilst Commandant of Medical Officers' Pool; Maj. A. V. J. Richardson, whilst Senior Medical Officer and Officer Comdg. Blandford Hospital; Maj. J. L. Birdie, whilst Inspecting Officer; Maj. A. E. Langdon, O.B.E., whilst Principal Med. Officer, S.-East Area; Maj. F. F. Minecke C.B.E., whilst Officer Commdg. R.A.F. Cent. Hosp. (Officers), Maj. H. F. Horne, whilst Chief Sanitary Officer; Capt. J. McIntyre, M.C., whilst empld. as Staff Officer, 1st Class, with Dir. of Med. Services.

Relative rank of Lt.-Col. :—Rev. R. Hall, whilst empld. as Principal Chaplain; Rev. W. Moffatt, whilst empld. as Principal Chaplain.

To be actg. Hon. Lt.-Col. :—Hon. Maj. M. W. Flack, C.B.E.

To be actg. Majs. :—Lt. W. W. Gibson, O.B.E., while spec. empld.; Capt. M. H. Smith, while spec. empld.; Capt. C. J. G. Taylor, Capt. W. Darling, Lt. & Capt. J. M. Kirkness, Capt. B. A. Playre, D.S.O., Capt. R. H. Knowles, Capt. A. A. Atkinson, Capt. H. D. Hewat, Capt. C. E. Thwaites, Capt. H. B. Porteous, Capt. H. M. S. Turner, Capt. H. A. Treadgold, Capt. H. E. Whittingham, Capt. J. J. C. Hamilton, Capt. A. P. Bowdler, Capt. T. S. Rippon, Capt. J. H. Porter, M.C., Capt. P. L. Moore, Capt. D. Johnson, Capt. D. Ranken, Capt. L. C. M. Wedderburn, Capt. J. MacGregor, M.C., Capt. M. R. Dobson, Capt. F. N. B. Smartt, Capt. W. C. Murray.

Relative rank of Maj. :—The Rev. B. W. Keymer, O.B.E., while empld. as Dep. Chaplain-in-Chief.

To be actg. Capts. :—Lt. L. C. Broughton-Head, while spec. empld.; Lt. C. H. Vernon, while spec. empld.; Lt. G. W. Harbottle, while spec. empld.; Lt. G. W. Allen, while spec. empld.; Lt. J. P. L. Biggs, while empld. at a Base Pay Office; Lt. C. H. Young, while empld. at a Base Pay Office; Lt. H. G. Jones, while empld. at a Base Pay Office.

The notification which appeared in "Gazette," May 9th, regarding the following is hereby cancelled :—Rev. R. E. V. Hanson, M.A., Rev. S. L. Clarke, M.A., B.Sc., Rev. S. J. Jones, M.C., Rev. J. Dey, D.S.O., Rev. R. Hall, Rev. W. Moffatt.

Lt. G. K. Johnson to be actg. Capt. while holding a spec. appointment at Ministry of Munitions, Oct. 28th, 1918 (substituted for notification in "Gazette," April 11th).

Maj. (actg. Lt.-Col.) H. R. Bentley (Ft., Spec. List) relinquishes his commn. on ceasing to be empld., May 8th.

Transferred to unempld. list :—Maj. H. Elwell, from (S.O.), April 24th; Capt. (actg. Maj.) L. M. Wells-Bladen, from (S.O.), April 30th; Lt. (actg. Capt.) F. A. Corbett, from (S.O.), May 6th.

Admiralty, May 24th.

MISCELLANEOUS SERVICES.

The King has been pleased to approve of the award of the Distinguished Service Cross to the undermentioned officer :—

Flt.-Lt. C. G. Bronson, R.N.A.S. (now Capt., R.A.F.). For carrying out a determined bombing attack on the "Goeben" on Jan. 25-28th, 1918, flying low down under heavy anti-aircraft fire.

FOREIGN DECORATIONS

The following decoration has been conferred by the President of the French Republic. The King has given unrestricted permission to the officer concerned to wear the decoration in question :—

Croix de Guerre.

Eng. Lt.-Comdr. E. F. Briggs, D.S.O., R.N. (now Lt.-Col (actg. Col.), R.A.F.).

War Office, May 23rd.

Corps of Royal Engineers.—Maj. E. Graham, late R.A.F., to be temp. Lt.-Col., May 10th.

AIR MINISTRY, May 23rd.

R.A.F.—The following temp. appointments are made :—Staff Officer, 1st Cl.—(Air).—Maj. (actg. Lt.-Col.) A. H. C. Kearsey, Dec. 28th, 1918, and to retain the actg. rank of Lt.-Col. to April 30th.

Staff Officers, 3rd Cl.—(P.).—Lt. (actg. Maj.) Hon. M. H. R. Knatchbull-Hugessen, M.C., relinquishes the appointment of Staff Officer, 2nd Cl. (Air), and the actg. rank of Maj., April 14th, and to be actg. Capt., from April 14th to April 30th; Lt. (actg. Capt.) A. T. Wynward-Wright, Jan. 25th, and to retain the actg. rank of Capt., to April 30th, vice Capt. M. W. Bovill, Lt. (actg. Capt.) W. S. Hill-Reid, Dec. 28th, 1918, and retains the actg. rank of Capt. to April 30th. (O.).—Lt. A. H. Burman, April 4th, vice Lt. (actg. Capt.) H. Sorrell). (T.)—Sec. Lt. (Hon. Lt.) (actg. Capt.) W. E. Cowie, Jan. 14th, and retains the actg. rank of Capt. to April 30th.

FLYING BRANCH.—Capt. F. G. S. Williams to be Capt. (A.), from (Ad.), March 14th.

Sec. Lts. to be Lts. :—(Hon. Lt.) R. J. McNab, April 6th, 1918; (Hon. Lt.) F. H. Allchurch, H. R. Hill, M.C., April 10th, 1918; R. W. Drewett, May 9th, 1918; (Hon. Lt.) M. McEwan, D.F.C., May 11th, 1918; (Hon. Lt.) C. P. Harrison, M.C., May 18th, 1918; J. S. A. Willis, R. L. Ridley, May 30th, 1918; (Hon. Lt.) C. A. S. Booth, May 30th, 1918; (Hon. Lt.) G. L. Childs, June 14th, 1918; (Hon Lt.) C. M. McGorrery, June 18th, 1918; (Hon. Lt.) J. R. Houghton, July 11th, 1918; (Hon. Lt.) T. R. Evans, Aug. 2nd, 1918; A. Murray, Aug 10th, 1918, J. Carrev, Aug 16th, 1918; H. F. Lea, Aug. 18th, 1918; (Hon. Lt.) H. J. Knudson, Aug. 23rd, 1918; A. P. Godfrey, Aug. 27th, 1918; F. A. Cooper, Sept. 1st, 1918; J. M. Craig, V.C., Sept. 6th, 1918; (Hon. Lt.) D. Storres-Fox, Sept. 10th, 1918; H. M. Crighton, Sept. 27th, 1918; H. E. Elsworth, Sept. 28th, 1918; R. P. A. Crisp, (Hon. Lt.) I. W. R. Grubb, Oct. 1st, 1918; (Hon. Capt.) H. W.

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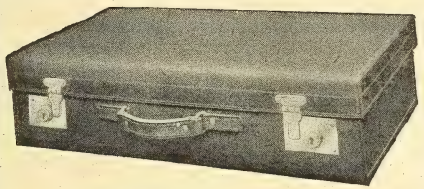
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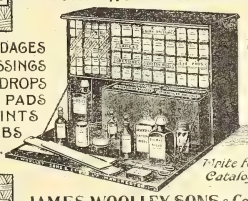
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Deacon, Oct. 6th, 1918; (Hon. Lt.) D. Hodson, Oct. 9th, 1918; G. Campbell, Oct. 15th, 1918; H. Mercer, M.C., (Hon. Capt.) N. Greenslade, M.C., Oct. 19th, 1918; J. A. Degaye, G. E. Moore, M.C., C. L. Pargeter, D.F.C., Oct. 26th, 1918; S. T. R. Lloyd (Hon. Lt.), K. Tully, Oct. 27th, 1918; J. Cave, J. C. Crook, (Hon. Lieut.) G. A. Snowball, Oct. 28th, 1918; E. F. Briggs, Oct. 31st, 1918; M. B. Joseph, Nov. 8th, 1918; S. A. Packman, Nov. 26th, 1918; R. Kelly, Nov. 30th, 1918; A. J. Hannah, Dec. 1st, 1918; A. J. Bird, Dec. 9th, 1918; E. J. Caprara, Dec. 27th, 1918; (Hon. Capt.) H. B. Wilson, D.F.C., Dec. 29th, 1918; A. E. Gardiner, (Hon. Lieut.) F. G. Allday, A. V. Crebbin, (Hon. Lieut.) W. Griffiths, Jan. 1st; A. E. Heath, Jan. 5th; V. Limerick, Jan. 15th; A. W. Rogers, M.M., W. L. Legg, C. Malthouse, P. W. Watson, A. F. Moyles, Feb. 1st; C. Longland, W. E. Hedley, Feb. 2nd; T. J. J. Griffiths, Feb. 16th; (Hon. Lt.) A. A. English, M.C., Feb. 18th; J. T. Rose, Feb. 22nd; H. Vanstone, Feb. 25th; O. E. Miller, Feb. 28th; A. D. Neish, Feb. 28th; A. Hirnseberg, March 1st; D. S. St. A. McCulloch, March 5th; J. H. Cogan, March 9th; J. B. F. Phillips, W. T. Ward, W. A. Peggs, A. G. Batterham, March 12th; W. L. Goddard, B. A. Greenfield, W. P. Mills, L. H. Weedon, H. J. E. Whitfield, March 26th; (Hon. Capt.) H. W. Beck, March 29th; B. H. Stretton, J. H. W. Haswell, C. Nottinghorne, C. M. Whitham, April 11th; E. S. Noble, H. G. Pope, J. Spencer, A. A. Sykes, April 12th; S. R. Austin, W. J. Barber, G. C. Hyde, April 13th; A. J. Fyfe, April 14th; F. Ollenbittle, L. C. Pitts, April 21st; M. E. Bradley, H. E. Cardwell, W. S. Campbell, E. Telfer, J. S. Pickles, D. U. Thomas, G. E. T. Payne, April 28th; J. L. Lund, M.C., April 28th; C. Rigby, May 1st.

D.S.O., M.C., Jan. 21st; Lt. A. D. Ferguson (Capt., High. L.I.), Feb.

The following relinquish their commns. on ceasing to be empld.:—Lt. J. F. Verner (Lt., B. Col. R.), Nov. 19th, 1918; Capt. A. E. McKeever, D.S.O., M.C., Jan. 21st; Lt. A. D. Ferguson (Capt., High. L.I.), Feb. 12th; Lt. L. O. Chandler (Lt., Sask. R.), Feb. 24th; Sec. Lt. (Hon. Lt.) J. Miller (Lt., Arg. and Sutherland Highrs.), Feb. 28th; Lt. D. A. Macdonald (Lt., Can. For. C.), March 10th; Lt. F. H. Taylor, M.C. (Lt., C. Ont. R.), March 18th; Lt. H. Carnegie (Lt., W. Ont. R.), March 31st; Lt. R. H. Johnson, April 1st; Lt. G. H. Gibbs (Sec. Lt., R.G.A.), April 7th; Lt. F. F. Gilpin (Lt., R.G.A.), April 11th; Lt. L. E. Porter (Capt., Canadians), April 14th; Capt. S. F. Penhallurick, March 15th; Lt. Kerr (Lt., E. Ont. R.), April 26th; Lt. O. Berry (Lt., Can. Gen. List), April 28th; Lt. (Hon. Capt.) K. Rawson-Shaw (Capt., R.A.), May 7th.

Capt. (actg. Maj.) T. Gran, M.C., is temporarily transferred to unempld. list, April 26th.

Transferred to unempld. list:—Sec. Lt. (Hon. Capt.) F. O. Sprinks, Feb. 5th; Lt. A. G. A. Spence, Sec. Lt. (actg. Lt.) W. A. Thompson, Feb. 9th; Lt. P. Rochard, Feb. 10th; Sec. Lt. P. W. Adams, Feb. 19th; Sec. Lt. P. B. Thorpe, Feb. 27th; Capt. C. E. Rich, March 1st; Sec. Lt. C. W. Blasdale, March 4th; Lt. C. Addenbroke, Sec. Lt. A. A. Doumouchtel, Sec. Lt. W. E. Penhallurick, March 15th; Lt. Kerr (Lt., E. Ont. R.), March 26th; Lt. R. Riet, D.F.C., March 19th; Capt. A. H. Sandwell, March 20th; Lt. A. V. Pearman, Sec. Lt. R. S. Sargent, Sec. Lt. J. G. Wynne-Williams, March 28th; Lt. H. E. Read, March 29th; Sec. Lt. E. A. Dietrich, Sec. Lt. C. A. Smith, Sec. Lt. E. Sobey, March 31st; Sec. Lt. T. Nisbet, Sec. Lt. W. C. Ritchie, Capt. J. Yates, April 1st; Lt. T. W. Robson, April 3rd; Sec. Lt. E. Ackroyd, Lt. C. C. Robinson, April 6th; Sec. Lt. J. S. Kenton, April 7th; Sec. Lt. H. G. Ramsay, April 8th; Sec. Lt. A. G. Pugh, April 9th; Lt. C. E. Willows, Sec. Lt. W. A. Ruxton, Sec. Lt. A. A. Robinson, Capt. W. A. G. Young, April 10th; Sec. Lt. T. G. Finney, Lt. F. Scott-Hall, Sec. Lt. R. Reynolds, April 11th; Lt. R. J. Morton (Middx R.), Lt. H. Newns, Lt. D. G. C. Wakeham, April 12th; Lt. G. Dania (R.F.A.), Sec. Lt. W. R. Leach, Sec. Lt. J. A. Loughley, Sec. Lt. L. B. Lake, Lt. C. E. Lind, Sec. Lt. G. L. Rutherford, Sec. M. Thomas, D.C.M., April 14th; Sec. Lt. C. G. Laug, Lt. B. O. M. Linton, Lt. F. W. York, April 15th; Lt. C. G. Langford, Sec. Lt. R. Rowe, A. W. Ford, Sec. Lt. G. E. Rochester, Sec. Lt. H. P. de Roeper, Sec. Lt. J. Ritchie, April 15th; Sec. Lt. R. U. Fuller, Sec. Lt. L. D. Pinches, Lt. E. T. Roocroft, April 16th; Lt. J. P. de E. Robinson, Lt. E. N. A. Remington, Lt. R. M. Rose, April 17th; Lt. (actg. Capt.) E. L. Raworth, April 18th; Lt. R. P. Darrell, Sec. Lt. F. T. Griffith, Lt. G. Hazlehurst, Lt. D. M. Wotherspoon, April 19th; Capt. E. Pierce, April 20th; Lt. H. C. Hayes, Sec. Lt. H. Stephenson, April 21st; Sec. Lt. H. Russell, Lt. A. W. Rogers, M.M., Sec. Lt. F. H. Roberts, April 22nd; Sec. Lt. E. G. Lay, April 23rd; Lt. W. P. Lancaster, Lt. D. H. C. Lye, Sec. Lt. D. McGibbon, Capt. (actg. Maj.) R. F. Redpath, Sec. Lt. P. Lawrence, Lt. P. N. Watson, April 24th; Sec. Lt. J. S. Hutchinson, Sec. Lt. H. W. T. Lewis, April 25th; Sec. Lt. C. E. A. Lovell, Lt. A. Marsh, April 26th; Lt. (Hon. Capt.) F. G. B. Reynolds, Lt. R. J. Owens, April 27th; Sec. Lt. E. R. Barrett, Lt. E. H. Land, Jr. (actg. Capt.) H. N. Lott, D.F.C., Sec. Lt. F. A. Rennison, April 30th; Sec. Lt. H. Musslin, Sec. Lt. J. Brackenborough, Lt. G. C. Draper, Lt. L. Green, Lt. C. F. Moore (High. Lt. Inf.), Sec. Lt. W. J. Potts, Lt. N. J. Robinson, Sec. Lt. S. P. F. Rust, Maj. H. H. Walmsley (substituted for notification in "Gazette" May 6th), April 30th; Lt. (actg. Capt.) F. L. Atkinson, Lt. (Hon. Capt.) J. N. H. Brooke, Lt. W. T. Griffiths, Lt. (actg. Capt.) H. Cochrane, M.C., Lt. A. W. Watson, Lt. P. Wilkins, May 1st; Sec. Lt. D. C. Bain, Capt. G. F. Browne, Lt. H. C. Brown, Capt. B. P. B. Carter, May 2nd; Sec. Lt. J. R. Cox, Lt. G. L. Dore, Sec. Lt. F. L. S. Dennett, Sec. Lt. W. O. Marshall, Sec. Lt. L. E. Peto, Sec. Lt. T. O. Wrightson, Sec. Lt. H. R. Wright, May 3rd; Lt. E. A. Bingen, R. Buss, Lt. L. J. G. H. Crispin, Lt. W. O. Stoddart, May 4th; Sec. Lt. R. G. MacLean, May 5th; Sec. Lt. (Hon. Lt.) R. A. Blake, Sec. Lt. E. G. Bernejo, Sec. Lt. P. R. Dawson, Sec. Lt. D. B. Recorden, Capt. V. H. Ramsden, May 6th; Lt. O. S. Brown (K.O.S.B.), Sec. Lt. D. A. Collin, Sec. Lt. H. Cox, Sec. Lt. A. W. Crozier, Sec. Lt. C. F. Davies, Sec. Lt. F. Dawson, Sec. Lt. H. C. Moncton, Lt. W. J. O. Millett, Lt. G. A. Randolph (N. Somerset Yeo., T.F.), Sec. Lt. J. L. Rolston, Sec. Lt. H. Rhodes, Lt. H. Rothery, May 7th; Lt. W. M. Butler, Sec. Lt. J. B. Brown, Sec. Lt. G. J. E. Boyd, Sec. Lt. K. R. Carson, Sec. Lt. L. G. Denniss, Lt. E. L. Dougal, Sec. Lt. G. W. Lazenby, Sec. Lt. W. Marshall, Sec. Lt. W. Spence, May 8th; Sec. Lt. E. S. Adamson, Sec. Lt. T. B. Anderson, Sec. Lt. G. Cockburn, Sec. Lt. P. H. Devenish, Sec. Lt. F. F. Lect, Sec. Lt. C. E. Richardson, Sec. Lt. J. M. S. Taylor, May 9th; Lt. N. P. Atkinson, Lt. H. W. Gammon, Sec. Lt. L. Ramsden, Sec. Lt. J. G. Reynard, May 10th; Sec. Lt. A. S. H. Ashton, Lt. A. J. Donaldson, Sec. Lt. J. W. Eccles, Sec. Lt. (Hon. Lt.) L. C. Rowney, May 12th; Sec. Lt. H. J. Bateman, Lt. N. J. Rich, May 13th; Sec. Lt. (Hon. Lt.) E. A. Collis, Sec. Lt. E. C. Garland, Lt. (actg. Capt.) D. M. Mackie, May 14th; Lt. F. W. Rennie, May 16th; Sec. Lt. H. E. Fox, Sec. Lt. K. C. Rappell, May 18th; Sec. Lt. H. Cooke, Sec. Lt. F. Eppacher, Sec. Lt. F. Ollenbittle, May 19th; Lt. E. F. Crabb, D.F.C., Sec. Lt. J. O. Dufort, Sec. Lt. S. R. Fleming, Sec. Lt. N. Fahey, Lt. H. F. Guynon, Sec. Lt. R. T. Graham, Lt. A. R. Grafton, Sec. Lt. P. D. B. Gillespie, Sec. Lt. J. H. Grahame, D.F.C., Lt. R. E. McMillan, Sec. Lt. J. B. McIntosh, Sec. Lt. M. D. Macpherson, Lt. R. F. Mccord, Lt. H. W. McKeague, Lt. W. McMahon, Sec. Lt. E. S. McNames, Lt. (Hon. Capt.) G. H. Pitt, Sec. Lt. E. S. Pollock, Sec. Lt. W. A. Prendergast, Lt. F. W. Rushton, M.C., Sec. Lt. J. W. Ross, Sec. Lt. E. F. Rogers, Sec. Lt. A. H. Smith, Sec. Lt. R. D. Smith, Sec. Lt. E. H. Searle, Sec. Lt. F. P. Shanahan, Sec. Lt. C. C. Tait, Sec. Lt. C. L. Tench, Sec. Lt. A. S. Underhill, Sec. Lt. T. E. White, May 20th; Sec. Lt. C. E. Evans, May 22nd.

The following Capts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank:—R. Redfern, D.F.C., May 12th; D. H. Chamberlain, May 16th (substituted for notification in "Gazette," April 11th, 1918).

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—A. R. Metelerkamp (caused by wounds), May 8th; E. L. Fosse (contracted on active service), May 10th.

The following Lts. relinquish their commns. on account of ill-health contracted on active service:—J. M. P. Adam (K.O.S.B., T.F.), May 7th; C. R. Gaffney (Lpool R., T.F.), May 8th.

Lt. F. W. Kantel (Can. F. Art.) resigns his commn., May 24th.

The following Sec. Lts. relinquish their commns on account of ill-health, and are permitted to retain their rank:—R. J. Acheson, G. F. Holford, A. G. Middleton, J. E. Parke (caused by wounds), May 8th; H. J. Andrews, A. J. Bishop (caused by wounds), May 13th; F. B. Miseroy, May 14th.

Sec. Lt. R. J. Loughleen is dismissed the Service for absence without leave, April 12th.

The surname of Capt. (actg. Maj.) R. H. B. Ker is as now described, and not Kerr as stated in "Gazette," Feb. 21st.

The surname of Sec. Lt. F. Wight is as now described, and not Wright as stated in "Gazette," April 1st.

The notification in "Gazette," April 1st concerning Lt D. A. McDonald is cancelled.

The notification in "Gazette," Feb. 21st, concerning Lt. H. S. Hill is cancelled.

The notification in "Gazette," Dec. 20th, 1918, concerning Sec. Lt. A. R. Lee is cancelled.

The notification in "Gazette," May 2nd, concerning Lt. (actg. Maj.) D. L. Blumenfield is cancelled.

ADMINISTRATIVE BRANCH.—Capt. G. Aste to be Capt., from (S.O.), May 1st.

Lt. (actg. Capt.) E. J. Smyth to be Lt., from (A.), and retains his actg. rank whilst empld. as Capt., from July 31st, 1918, to April 30th.

Lt. C. F. Eckel to be Lt., from (A.), Feb. 7th (substituted for notification in "Gazette," Feb. 7th).

Lts., to be Lts., from (S.O.):—H. Atkins, J. E. Fike, J. B. F. Watson, May 1st.

Sec. Lts. to be Lts.:—(Hon. Lt.) A. Colling, C. C. Gardner, J. W. Gardner, E. J. Girdler, (Hon. Lt.) G. A. McMillan, April 2nd; (Hon. Lt.) T. B. Gilbert, April 4th, 1918; S. F. A. Welsh, July 22nd, 1918; T. S. Miller, July 28th, 1918; J. S. Archer, Sept. 31st, 1918; J. H. Payne, M.C., Oct. 11th, 1918; A. L. Kent, Oct. 22nd, 1918; H. T. Bolt, Oct. 23rd, 1918; (Hon. Lt.) N. S. Beale, Oct. 27th, 1918; A. P. Steer, Dec. 31th, 1918; E. J. Crowe, E. R. Harris, Jan. 5th; E. W. Bourne, Feb. 16th; W. Lienard, M.B.E., Feb. 24th; T. McGoddard, Feb. 26th; E. E. Page, Feb. 28th; J. F. Groom, March 7th; L. Singer, J. Rustwaite, from (S.O.), March 16th; F. S. E. May, March 26th; H. Royston, April 1st.

Sec. Lts. to be actg. Lts. till April 30th:—W. D. Cooney, F. Drake, F. Dallow (substituted for notification in "Gazette," Jan 31st), D. T. Davies, (Hon. Lt.) T. J. Harrington, P. E. Hudson, T. Moorcraft, R. H. Sturgeon (substituted for notification in "Gazette," March 28th), W. Shaw, R. N. Walter, Sept. 18th, 1918; W. W. Archer, Sept. 21st, 1918; E. J. Jordan, Sept. 23rd, 1918; E. C. St. A. Newby, Sept. 24th, 1918; (Hon. Lt.) T. Sutherland, Oct. 10th, 1918; W. R. Bowmer, Nov. 1st, 1918; J. O. Minshall, Nov. 8th, 1918; (Hon. Lt.) R. Blackith, Jan. 25th; H. C. Wilkin, March 1st.

Sec. Lts. to be actg. Lts. till April 30th, without pay and allowances of that rank:—(Hon. Maj.) J. L. McLean, C. Lyons, Sept. 16th, 1918; N. W. Seyler, Oct. 15th.

J. G. N. Cliff (Lt., R.N.) is granted temp commn. as Lt., April 1st.

Sec. Lt. de Jamies to be Sec. Lt., from (O.), Oct. 12th, 1918 (substituted for notification in "Gazette," Feb. 4th).

Transferred to unempld. list:—Lt. C. B. Stenning, Feb. 2nd; Lt. (actg. Capt.) H. W. Tait, D.F.C., Feb. 25th; Sec. Lt. C. H. Marston, March 7th; Lt. C. F. Morris, March 12th; Sec. Lt. H. J. Alcock, March 21st; Sec. Lt. R. H. Richardson, March 25th; Sec. Lt. (Hon. Lt.) W. Moore, April 1st; Sec. Lt. W. R. Rudall, April 8th; Lt. A. L. C. Hartland-Rowe, April 10th; Capt. R. Rennison, April 12th; Sec. Lt. G. Rogers, April 14th; Sec. Lt. H. Ridley, April 15th; Sec. Lt. G. I. Larkins, April 16th; Capt. J. C. B. Longbotham, April 18th; Lt. R. R. Tattersall (Ryl. Def. Corps, T.F.), April 20th; Lt. (Hon. Maj.) W. B. Dunn (Dublin Fus.), Sec. Lt. D. P. Fulton, April 26th; Sec. Lt. A. P. Cragg (Lancs. R.), Lt. (Hon. Capt.) R. W. F. Cecil (Capt., Sp. List), Sec. Lt. (Hon. Capt.) (actg. Capt.) W. H. P. Rees, April 30th; Lt. J. F. Byrom (Lancs. Fus.), May 2nd; Lt. (actg. Capt.) W. N. Downey, Sec. Lt. L. Waustaff, May 3rd; Lt. A. M. Grumbly (Middx R.), Lt. W. T. Rees, May 4th; Lt.-Col. W. F. Fraser, O.B.E., Sec. Lt. (Hon. Lt.) (actg. Capt.) H. R. Marston (Manch. R.), Lt. (actg. Capt.) E. Martin, M.C. (Lond. R.), May 7th; Maj. W. H. Adkins, Sec. Lt. L. G. D. Caines, May 9th; Sec. Lt. C. B. Foster, Lt. W. G. Fox, Sec. Lt. C. E. Rogers, May 10th.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—B. S. Andrew (contracted on active service), A. de M. Bellairs (contracted on active service), May 8th; J. W. Holdsworth, May 14th.

The following Lts. relinquish their commns. on account of ill-health:—E. Akhurst (Devon R., T.F.) (contracted on active service), May 5th; Actg. Capt. D. A. M. MacManus (K. Innis. Fus.), caused by wounds, May 9th.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—A. F. Foulder, May 9th; A. Wright, May 12th; S. J. Darmody (caused by wounds) H. W. Turner, May 15th.

The Christian name of Capt. Henry Cox is as now described and not F. Cox as stated in "Gazette," April 4th.

The notification in "Gazette," Nov. 8th, 1918, concerning Lt. W. H. Fox is cancelled.

The notification in "Gazette," May 6th, concerning Sec. Lt. R. C. Rogers is cancelled.

The notification in "Gazette," May 6th, concerning Capt. (actg. Maj.) N. A. Daniell is cancelled.

TECHNICAL BRANCH.—Sec. Lts. to be Lts.:—H. Chapman, July 12th, 1918; J. E. Keoford, C. G. Stevens, Aug. 2nd, 1918; S. J. Fountain, Sept. 14th, 1918; T. F. Morton, Jan. 18th; F. A. Beale, Jan. 27th.

Sec. Lts. to be Lts., without pay and allowances of that rank:—T. Allan, (Hon. Lt.) F. Baxter, C. H. Blakeway, C. Cadman, R. Donald, (Hon. Lt.) W. Glass, (Hon. Lt.) J. B. Glass, E. A. Fulson, C. B. Monkman, A. R. Rouse, H. Scott, (Hon. Lt.) H. W. Vowden, April 2nd, 1918; C. J. Geddes, April 9th, 1918; E. W. Brooks, R. E. Pudney, June 8th, 1918; (Hon. Lt.) F. A. Baker, M.C., June 16th, 1918; G. R. Willis, June 20th, 1918; A. Christian, Aug. 2nd, 1918; (Hon. Lt.) T. G. S. Symonds-Babb, Aug. 14th, 1918; V. E. R. Belton, Aug. 20th, 1918; (Hon. Lt.) A. G. Mortlock, Oct. 11th, 1918; J. K. Shrimpton, Oct. 13th, 1918; J. Buckthought, Oct. 15th, 1918; R. H. Semmence, Oct. 26th, 1918; H. B. Ballard, Nov. 25th, 1918; D. W. Emonds, Dec. 2nd, 1918; (Hon. Lt.) F. H. L. Varcoe, Dec. 30th, 1918; T. M. Kearney-Dodds, Jan. 1st; C. L. Taylor, Jan. 10th; J. C. Shakeshaft, Jan. 31st; G. J. Finley, Feb. 16th; worth, Feb. 20th; T. Mundy, F. A. Murray, May 8th; A. Broadley, F. S. G. Glenn, C. W. Triggs, Feb. 24th; H. W. Halifax, Feb. 25th; G. Ashmockford, H. B. Norris, March 24th; M. G. Church, April 3rd; E. V. T. Knight, April 5th; C. B. Pensotti, April 17th; G. Betts, C. T. Davis, F. Whillon, April 18th; W. J. Aubert, A. Hill, H. Hillsdon, N. W. Nicholl, W. H. Saunders, W. F. Wallace, April 19th; R. D. G. Macrostie, April 20th; J. Armitage, P. L. Hill, F. Woffenden, April 23rd; A. H. S. Synge, April 24th; C. A. C. Fidler, F. W. Powell, April 28th; H. B. Hawker, L. J. Lipscomb, April 29th.

Sec. Lt. E. J. Peck to be actg. Lt. whilst empld. as Lt., Grade (B), from (A), from Jan. 25th to April 30th.

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. (Hon. Lt.) W. A. Lepper (E. Kent R.), July 2nd, 1918; Capt. A. Landen, D.S.O. (North'd Fus.), April 11th; Capt. (actg. Maj.) E. Graham, May 9th.

Transferred to unempld. list:—Lt. (actg. Capt.) S. L. Amor, Feb. 27th; Lt. (actg. Capt.) J. M. R. E. St. Amory, March 27th; Lt. J. R. G. Bowden, April 1st; Sec. Lt. E. G. Quiddington, April 6th; Sec. Lt. V. Rhead, April 7th; Capt. J. H. Ward, April 13th; Capt. T. M. Ritchie, Sec. Lt. (actg. Lt.) H. S. Rogers, April 16th; Sec. Lt. H. G. Webster, April 17th; Sec. Lt. W. J. Fenton, April 19th; Sec. Lt. R. E. Sharples April 20th; Lt. L. Rawnsley, April 21st; Capt. (actg. Lt.-Col.) M. Deacon, Sec. Lt. (Hon. Lt.) (actg. Capt.) H. M. Roothan, April 25th, Maj. (actg. Lt.-Col. F. A. G. Noel, O.B.E., Sec. Lt. H. A. Parsons, April 30th; Sec. Lt. (actg. Capt.) B. G. Bryan, Capt. (actg. Maj.) J. C. Derham, Lt. (actg. Capt.) W. H. M. Groom, May 1st; Sec. Lt. E. G. Barnard, Sec. Lt. C. W. Phipps, May 2nd; Sec. Lt. (Hon. Lt.) S. M. Baker, Lt. W. R. Maunder (R.E.), May 3rd; Sec. Lt. (actg. Capt.) S. R. Chapman, April 4th; Lt. (Hon. Lt.) B. O. Augell, Lt. H. S. Wilkins, May 5th; Capt. R. H. Meers, May 6th; Lt. C. W. Bickley ((Gloster R., T.F.), May 7th; Lt. H. V. Albrow, Sec. Lt. G. F. Mitchell, May 8th; Capt. H. Rochford, May 9th; H. Ellingham, Lt. A. O. Fuller, Sec. Lt. A. E. Wolveridge, May 10th; Maj. A. H. S. MacCallum, Lt. (actg. Capt.) E. L. Ravenscroft, Lt. R. C. Rayner, 11th; Sec. Lt. F. H. Alder, May 19th; Sec. Lt. J. H. Glew, Sec. Lt. G. McLaughlin, April 20th.

Sec. Lt. (Hon. Lt.) P. A. Albrecht relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain the rank of Lt., May 9th.

Sec. Lt. E. A. Morrow relinquishes his commn. on account of ill-health, and is permitted to retain his rank, May 13th.

Sec. Lt. H. Falkner (R.E.) relinquishes his commn. on account. of ill-health, May 12th.

The surname of Sec Lt. G. W. Heugh is as now described and not Hengh as stated in "Gazette," Jan. 24th.

The notification in "Gazette," Nov. 22nd, 1918, concerning P. Allden is cancelled.

The notification in "Gazette," April 1st, concerning Lt. (actg. Capt.) H. Jones is cancelled.

MEDICAL BRANCH.—Lt. W. C. A. Ovey is transferred to the unempld. list, March 25th.

MEMORANDA.—The following relinquish their commns. on ceasing to be empld.:—Lt. J. B. Hamilton, Feb 16th; Temp. Hon. Lt. W. C. Boswell, May 16th.

Transferred to unempld. list:—Maj. (actg. Lt.-Col.) R. W. Roylance, from (S.O.), Jan. 27th; Lt. (actg. Maj.) D. L. Blumenfield, April 1st; Capt. P. White, from (S.O.), April 3rd; Capt. (actg. Maj.) H. French, from (S.O.), April 11th; Maj G. M. T. Rees, O.B.E., from (S.O.), April 26th; Lt.-Col. W. L. Marsh, O.B.E., from (S.O.), May 1st, Lt. (actg. Capt.) J. S. Berdoe, from (S.O.), May 5th; Sec. Lt. (Hon. Lt.) (actg. Capt.) E. F. Colman (S. Staffs R., T.F.), from (S.O.), May 10th; Lt. (actg. Capt.) P. Ellis, from (S.O.), Capt. E. Cameron (Staffs Yeo.), from (S.O.), May 13th.

The rank of Lt. (actg. Capt.) J. E. B. Cochrane is as now described, and not Sec. Lt. as stated in "Gazette," May 9th.

The notification in "Gazette," March 14th, concerning Lt. P. S. Woodroffe is cancelled.

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, May 23rd.

The King held an investiture in the quadrangle of Buckingham Palace at 11 o'clock this morning.

The following officers were severally introduced into the presence of the King, when His Majesty invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE (Military Division).—Commander.—Brigadier-General John Houison-Craufurd, R.A.F.

THE DISTINGUISHED SERVICE ORDER.—Captain George Dacre, R.A.F.

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE (Officers).—Military Division.—Col. Sidney Smith, R.A.F.; Lieut.-Col. Edward Melville, R.A.F.; Lieut.-Col. Francis Roxby, R.A.F.; Lieut.-Col. Frederick Scholte, R.A.F.; George Abell, R.A.F.; Major Claude Bonnett, R.A.F.; Major Harold Lecomber, R.A.F.; and Capt. Edward Stapleton, R.A.F.

Member.—Military Division.—Capt. Leonard Lander, late R.A.F.

The King then conferred decorations as follows:—

THE DISTINGUISHED SERVICE CROSS.—Capt. Rupert Forbes-Bentley, R.A.F.

THE CASUALTY LIST.

AIR FORCE.

Reported May 21st.

ACCIDENTALLY KILLED.—Beanlands, Capt. B. P. G., M.C., R.A.F.
Cooper, Lt. D. G., R.A.F.
Davis, Sec. Lt. C. S., R.A.F.
Harrison, Sec. Lt. C., R.A.F.
Harwood, Lt. G., R.A.F.
Hunt, Lt. C. F., R.A.F.
Knott, Capt. E. M., A.F.C., R.A.F.
Kretmar, Sec. Lt. W. F. K., R.A.F.
Robinson, Maj. H. H., M.C., R.A.F.
Salmon, Sec. Lt. F. C., R.A.F.
Smith, Sec. Lt. A. S., R.A.F.
Stace, Lt. A. H. B., R.A.F.
Twilton, Lt. R. J., R.A.F.
DIED OF INJURIES.—Perrin, Maj. M. N., R.A.F.

ADMIRALTY APPOINTMENTS.

The following appointments have been made:—

MAY 21st.—Payr. Lieuts.—G. A. Whiting, to "Engadine," in charge, June 15th.

MAY 23rd.—Wt. Shipwrt.—J. Myott, to "Vindictive" (undated).

Royal Canadian Navy.—Lieut.—D. St. G. Lindsay, to "Empress," May 22nd.

MAY 24th.—Comdrs.—B. P. MacMahon, to "Argus," May 23rd.

Lieuts.—J. G. Moncrieff and C. M. V. Gooding, to "Argus," May 23rd.

MAY 26th.—Temp. Lieut.—E. W. Kent, to "Empress" (undated).

OFFICIAL COMMUNIQUÉS.

The following was issued by the India Office on May 21st:—

On the 17th the First (Indian) Brigade, with the co-operation of aeroplanes, attacked the enemy on the hills to the west of Dakka, which were captured by 3.50 p.m.

The following telegrams have been received from the Viceroy of India:—

MAY 21st.—On May 20th buildings in Jelalabad from which shots were fired at our aeroplanes were successfully bombed, the Afghan headquarters barracks being hit, as well as a parade of some 2,000 troops and a column of troops on the march.

MAY 22nd.—Air reconnaissances report no movements of importance west of Jelalabad. The tribes along the whole frontier are reported to be still quiet. No further active operations are reported beyond the effective bombing of troops at Kahi and Pesh-Boulak [16 miles west of the frontier opposite Peshawar].

The India Office issued the following statement on May 26th:—

With reference to the statement that has appeared in the Press to the effect that the Afghan Commander-in-Chief applied for a cessation of hostilities, the facts are as follows:—

In telegraphing on May 15th to the Secretary of State on the military position the Government of India incidentally mentioned the receipt of such an application, but without appearing to attach much importance to it. The Secretary of State at once telegraphed for further particulars, and asked whether the request could not be made the basis of negotiation.

In reply the Government of India telegraphed on May 18th the full text of the Commander-in-Chief's message, which was addressed to the Political Agent, Khyber, and ran as follows:—

"Sir,—As regards the outbreak of war between Afghanistan and Britain, I have the honour to inform you that British officers commenced an unlawful war without any declaration of war on any side, and by this aggressive step inflicted heavy losses on the civil population and army of Afghanistan by throwing bombs from aeroplanes.

"I am informed by his Majesty the King of the independent kingdom of Afghanistan that his Majesty has received a letter from his Excellency the Viceroy, and in consequence of that I am ordered to suspend war, thus unlawfully begun by your side, until further orders.

"You are accordingly informed that war has been suspended until a final decision has been reached by correspondence between his Afghan Majesty and his Excellency the Viceroy."

The Government of India added that this insolent message was obviously devised to gain time, an explanation to which the Afghans themselves gave currency among the frontier tribes, and that they had instructed the Political Agent, Khyber, to reply that he was not authorised to answer the message, and that if the Ameer wished for peace he should address the Viceroy through the officer in command of the British forces.

To this invitation the Ameer so far has made no response, and offensive preparations continue to be made by the Afghans along the whole frontier.

It need hardly be said that the allegations made in the message as to aggressive action by British Officers were entirely without foundation.

The Ameer's reply to the Viceroy's letter protesting against the Afghan proceedings has now been received. It is defiant in tone, and leaves no doubt as to Amanullah's personal complicity.

The following was issued by the India Office on May 26th:—

On May 22nd air reconnaissance reported no movements of importance east of Jelalabad. Afghan troops on the Dakka front were reported to be having difficulty with their ration supply and local Lashkars to be disinclined to concentrate for the same reason.

MAY 25th.—The Zakka Khel maliks have brought in without ransom two airmen, Lieuts. Hoare and Barker, who were forced to descend in the Bazar Valley, that is, tribal territory [in the Khyber region; the Zakka Khels are Afridis].

From Jelalabad it is reported that great confusion was caused there by the air raid on May 21st. Several Government buildings were set on fire and the town is reported as practically deserted.

PERSONAL NOTICES.

NAVAL.

DEATHS.

RAWLINGS.—The death of Capt. Townley Rawlings, R.A.F. (late R.N.A.S.), in the accident to the Tarrant triplane reported in another place, is a great loss to British aviation. During the war he won the Distinguished Flying Cross for a very meritorious piece of work, the bombing of the German-Turkish battleship "Goeben" as she lay off Constantinople. His long flight for that purpose actually started at Margate; and he finally descended at Mudros.

STEWART.—Flight Sub-Lieut. William Houston Stewart, R.N.A.S., was reported missing on May 26th, off the Belgian Coast, and is now presumed to have been killed. He was the only son of A. W. Houston Stewart and the grandson of the late Admiral Sir W. Houston Stewart, G.C.B.

ENGAGEMENT.

CLARK-HALL—LOCKHART.—The marriage of Lieut.-Col. R. H. Clark-Hall, D.S.O., R.A.F. (Comdr., R.N.), and Lillias, daughter of Col. and Mrs. R. Elliott Lockhart, The Hewke, Lockerbie, will take place at 2 p.m., on June 11th, at All Saints, Lockerbie.

BIRTH.

GREIG.—On May 20th, at Hemsby Hall, Norfolk, the wife of Major Louis Greig, M.V.O., M.B., R.A.F. (Surgeon-Lieut. Car., R.N.), a daughter.

MILITARY.

DEATHS.

BEANLANDS.—Captain Bernard Paul Gascoigne Beanlands, M.C., 1st Hants, attached R.A.F., who was killed on May 8th while flying at Northolt, was the son of the late Canon Beanlands, M.A., F.S.A., of Wickhurst Manor, Sevenoaks Weald, sometime Rector of Christ Church Cathedral, Victoria, B.C., and of the late Laura Maud Hills. He was 21 years of age.

HOWARTH.—It is now assumed that Capt. Norman Howarth, R.A.F., late R.F.C., died on, or since Sept. 6th, 1918, on which date he was shot down between Bohain and St. Quentin. It has been impossible to obtain any information as to whether Capt.

Howarth was killed in an air fight, or whether he died after reaching the ground, nor has it been possible to discover whether he was buried near where he fell.

Norman Howarth will be remembered by the old-timers at Hendon as one of the most regular pilots of the London Aerodrome. He was a particularly safe and steady flier although very skilful, and he handled his machine with a neatness which stamped him as a pilot of quite the first class. At the outbreak of war he joined the R.F.C., and, in course of time, was promoted to Flight Commander. He did a very great amount of flying at the front besides spells of instructing at home. His quietness and modesty of demeanour won him many friends in the R.F.C., and when he was reported as missing his Commanding Officer wrote regretting the loss of one who was so intensely keen and such an excellent Flight Commander.

Capt. Howarth leaves a young widow to whom one tenders the deepest sympathy.

ROBINSON.—Major H. Huntley Robinson, M.C. (bar), Medical Officer, 9th Wing, R.A.F., whose death was announced recently, was the second son of Dr. and Mrs. H. Shapter Robinson, of "Crantock," Epsom, formerly of Talfourd House, Camberwell. Born in May, 1889, he qualified M.R.C.S., L.R.C.P., in 1912, at the London Hospital, where he acted as house surgeon. He joined the R.A.M.C. as Medical Officer to the 21st London Regiment just before the declaration of war, and went to France early in 1915, where he served continuously with the 47th Division until last November, when he transferred to the R.A.F. He was three times mentioned in dispatches, and was awarded the M.C. and bar.

ROWELL.—Capt. William Cecil Rowell, 1st Batt. Loyal North Lancashire Regiment, attd. R.A.F., who died on May 22nd at the R.A.F. Auxiliary Hospital, 82, Eaton Square, W., was the only son of Mr. and Mrs. Spencer Rowell, of Kenwyn, Newton Abbot. He was 26 years of age.

MARRIAGES.

WEST—RICE-EVANS.—On May 9th, at the Parish Church, Marylebone, London, Theodore James West, M.C., R.A.F., was married by special licence to Peggy, second daughter of the late Walter Rice-Evans, Esq., J.P., and Mrs. Rice-Evans, of Eagles Bush, Neath, Glamorganshire.

BIRTHS.

BOWEN.—On May 26th, at Nepicar House, Wrotham, Kent, the wife of Lieut.-Col. J. B. Bowen, Pem. Yeo. and R.A.F., of a daughter.

AIR FORCE.

DEATHS.

BRIDGETT.—Sec. Lieut. Claude Bridgett, R.A.F., who was previously reported missing is now officially believed to have been killed at Gaudach, near Metz, on Sept. 13th, 1918. He was the youngest son of the late William Beddome Bridgett, and the step-son of Mrs. Bridgett, of 12, Briar Walk, Putney, S.W. He was 18 years of age.

CARTER.—Major Albert D. Carter, D.S.O., a Canadian, was killed while flying near Shoreham, on May 22nd. When at a great height the wing of his aeroplane broke and the machine crashed in a meadow close to Lancing College. Major Carter was 26 years of age.

CRADDOCK.—A verdict of "Accidental death, due to trying to turn the aeroplane at the low height of 30 ft." was returned on May 22nd at the inquest on the body of Air Mechanic George Craddock, of Rushden, Northamptonshire, held at Coventry.

A.M. Craddock and Lieut. Carruthers, R.A.F., had been in the air 10 minutes, and on a second descent the aeroplane nose-dived. The Coroner said that the accident would never have occurred had a higher altitude been taken for turning.

PRINCE.—Lieut. Frederick George Prince, R.A.F., 68th Squadron, was killed on May 17th, at Centocelle Aerodrome, Rome, during a flight from France to Egypt. He was the only son of Mr. and Mrs. F. T. Prince, of West Dulwich, and was 27 years of age.

MARRIAGE.

BUCKINGHAM—MILTON.—On May 21st, at St. Mary Abbot's Church, Kensington, Captain William Buckingham, M.C., R.A.F., eldest son of W. Buckingham, Esq., of Sydney, was married to Jessica Edith, youngest daughter of Mr. and Mrs. Frank Milton, of Hill Place, Haslemere, Surrey.

RODMELL—TISCHMACHER.—On May 10, 1919, at Belfort, France, Sec. Lieut. John W. Rodmell, R.A.F., only son of the late John Rodmell, of Hull, was married to Isabelle Francoise, daughter of M. Joseph Tischmacher, of Belfort.

BIRTHS.

COLLINS.—On May 21st, at the Principal's House, Wye College, the wife of Captain C. Hart Collins, R.A.F., of a daughter.

LEWIN.—On May 18th, at 59, Tyzack Road, Woodseats, Sheffield, the wife of Lieut. H. S. Lewin, R.A.F., of a son.

NEWELL-ROBERTS.—On May 20th, at "Aston Greys," Boscombe, Hants, Doris, the wife of Capt. F. N. Newell-Roberts, R.A.F.—a daughter.

SMITH.—On May 12th, at 8, Percy Road, Boscombe, the wife of Lieut. J. D. Smith, R.A.F., of a son.

WICKHAM.—On May 20th, at a nursing home, Ealing, the wife of Sec. Lieut. R. T. Wickham, R.A.F., of a son.

* * *

On May 23rd a seaplane, while on patrol at Felixstowe, dived and crashed into the new pier. The pilot (Capt. Nunn, R.A.F.) the observer (Lieut. Boyes, R.A.F.) were injured, the former slightly and the latter more severely.

* * *

Capt. Elgie Jefferson, R.A.F., the only son of Mr. Thomas Jefferson, of the Isle of Man, left England on May 19th, piloting an aeroplane carrying despatches for Paris. The machine and dispatches have since been recovered from the English Channel, but there is no trace of Capt. Jefferson. It is feared that when the aeroplane fell into the sea the pilot was drowned

AVIATION IN AFGHANISTAN.

According to a message dated May 15th from "The Times" correspondent at Simla, it is officially announced that the Commander-in-Chief of the Afghan army has sent a letter to the Political Agent for the Khyber Pass asking for a cessation of hostilities. It is alleged that the British air raids into Afghanistan are one of the chief causes of this request.

AN AIR RAID ON ASTRAKHAN.

The British aviators stationed at Baku carried out a successful air raid over Astrakhan recently, and dropped bombs on the docks and shipping in the harbour. A number of bursts were observed on warehouses and shipping.

ATHLETICS IN THE R.A.F.

The Royal Air Force annual athletic meeting for the challenge cup presented by the King will take place on Thursday, August 21st, at Stamford Bridge Ground, Chelsea. The events included in the composition are :—

Flat races for distances of 100, 220, 440, and 880 yards ; one mile and three miles ; hurdle ; high jump ; long jump ; relay race ; tug of war ; and a W.R.A.F. relay race.

The competition is an inter-area one, and after preliminary selection one team will be selected to represent each area for each team event, or three individuals in the case of individual events.

BOXING.

The Championship Meeting, held by the Amateur Boxing Association at the Northampton Institute, was concluded on Saturday. The attendance was very much better than on the day before, and the boxing, as a whole, was interesting, each bout being keenly contested. Results :—

Heavy-weights.—Second round.—Lieutenant G. H. Price (R.A.F.) beat E. Griffiths, D.S.M. (London Fire Brigade)—stopped by referee in first round.

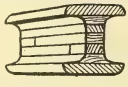
Semi-final round.—C. Copp (R.M.A.) beat Lieut. G. H. Price (R.A.F.)—retired in second round.

Final round.—H. Brown (Belsize B.C.) beat C. Copp (Royal Marine Artillery)—retired in the second round.

THE LOSSES OF THE FRENCH AIR SERVICE.

The following figures are taken from the French official statistics, and comprise the losses of Service d'Aviation Militaire from August 4th, 1914, to Nov. 11th, 1918.

In the Army zones were 1,945 pilots and observers killed, 1,461 missing whose death is certain, and 2,022 wounded. In the interior zone the losses were 1,927 pilots and observers killed and wounded. The total number of aviators in the French Aviation Service on Dec. 1st, 1918, was 19,219.

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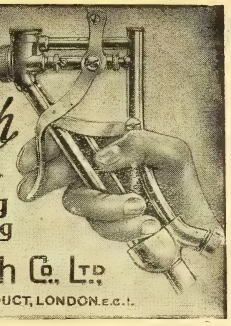
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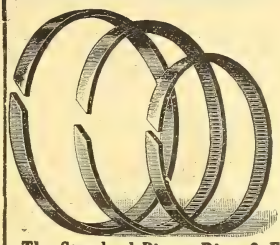
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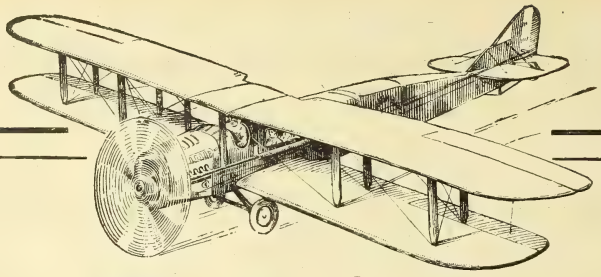
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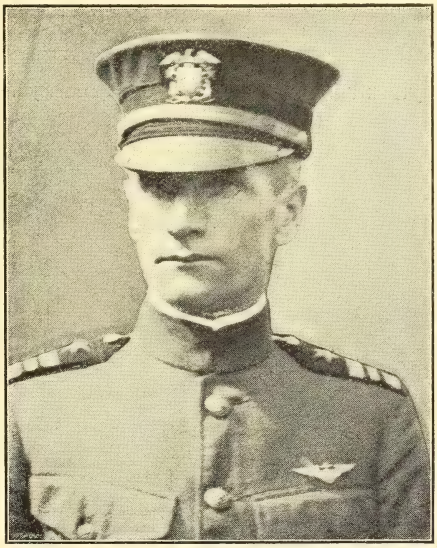
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ON THE DEFEAT OF THE ATLANTIC.

All who are concerned with aeronautics in any form or phase must congratulate the American Nation on the fact that American aviators have defeated the Atlantic Ocean. Naturally we of the British Empire would have preferred that a British aviator should have been the first to succeed in crossing from the New World to the Old by air, but if it could not be one of ourselves we are glad that the honour should belong to those of British race.

Also there is pure poetic justice in the victory being won by the Americans. After all, the first people to fly were the Wright brothers in 1903, on a machine of their own build with an engine of their own make. The first flights off and onto water were made by Glenn Curtiss in 1911, also on a machine and engine of his own production. And the first flying-boat was designed and built by Glenn Curtiss in 1913, again with a home-made engine. Who therefore has a better right to be first across the Atlantic than an American crew on an American flying-boat with American engines? We may regret our own failure, but we cannot grudge America her brilliant success.

Also, although we may regret that the first crossing was not made to the British Isles, there is again poetic justice in the fact that the first journey by air across the Atlantic should be made to that Peninsula whence sailed Christopher Columbus on the voyage which re-discovered America to the civilised world of his day.



Lieut.-Commander A. C. READ, U.S.N., Commanding N.C.4, the first aircraft to cross the Atlantic by air.

The Organisers of Victory.

The American victory was the deserved result of great personal gallantry, great skill in the design, preparation, care and handling of the machine and her engines, and great ability in seamanship and airmanship. But above all it was a triumph of organisation—which is just where we in this country fail so constantly.

Of the gallantry of all concerned there is little need to write. The story of the flight speaks for itself, little as is known of that story up to the present. Nothing could beat the pluck of Commander Towers and the crew of N.C.1, who navigated their boat for 200 miles in the open Atlantic, minus a wing-tip float which had carried away at the start (flying-boat aviators will appreciate the feat at its full value), and fetched up at the end of the first stage under their own power, disdaining assistance proffered by escorting ships. Their fine effort is made finer by the fact that they rode out two gales in the course of their voyage on the water.

The way in which Lieut.-Commander Bellinger and his crew stuck to N.C.3 till she sank is in accord with the best traditions of Naval service.

Nor is there any need to enlarge on the gallantry of Lieut.-Commander Read and his crew, who, after seeing their consorts wrecked and after having covered a World's Record non-stop journey of 1,300 miles, started forth on another 1,000-mile journey entailing equal risks. Be it remembered that though they had a few days in which to overhaul their craft they had no time to make any important replacements, and they took the chance of any internal damage which might have been done by their previous great effort.

The Success of the Pioneer.

It is particularly pleasing to know that Mr. Glenn Curtiss, the pioneer of water-flying, should have had so great a share in this epoch-making event. The initials N.C. stand for Navy Curtiss, the three boats being the joint products of the U.S. Navy and of Mr. Curtiss.

It will be remembered that not only did Glenn Curtiss produce the first flying-boat, but that he built—just before the war—the first multiple-engined flying-boat. This was ordered by Mr. John Wanamaker, the American millionaire, for an attempt on the Atlantic passage. It was built originally at the Curtiss shops at Hammondsport with two Curtiss engines, and tested on Lake Keuka. As it failed to lift a trans-Atlantic load with two engines, a third engine was fitted, and with this additional power it flew fairly well. From it are descended all the big flying-boats of to-day.

The N.C. boats were built in Mr. Glenn Curtiss' own shops at Garden City, Long Island, New York State, where he established himself after his works at Hammondsport and Buffalo were taken over by financiers for pure production. These works, one gathers, now belong to Mr. Willys of the Overland Car, and are without interest to Mr. Curtiss, who continues to be faithful

to his earliest love, the life of a pioneer and experimenter. He is happy in that he has now the money with which to experiment on the grand scale, and the N.C. boats bear witness to his success in his new-old *métier*.

All those who met and learned to like Glenn Curtiss during his all-too-brief visits to Europe, when he won the first Gordon-Bennett race at Reims in 1909, and when he introduced his flying-boat to Europe in 1913, will rejoice in his success. His personal modesty and his self-evident honesty won the highest regard of all who knew him.

The Scientists' Part.

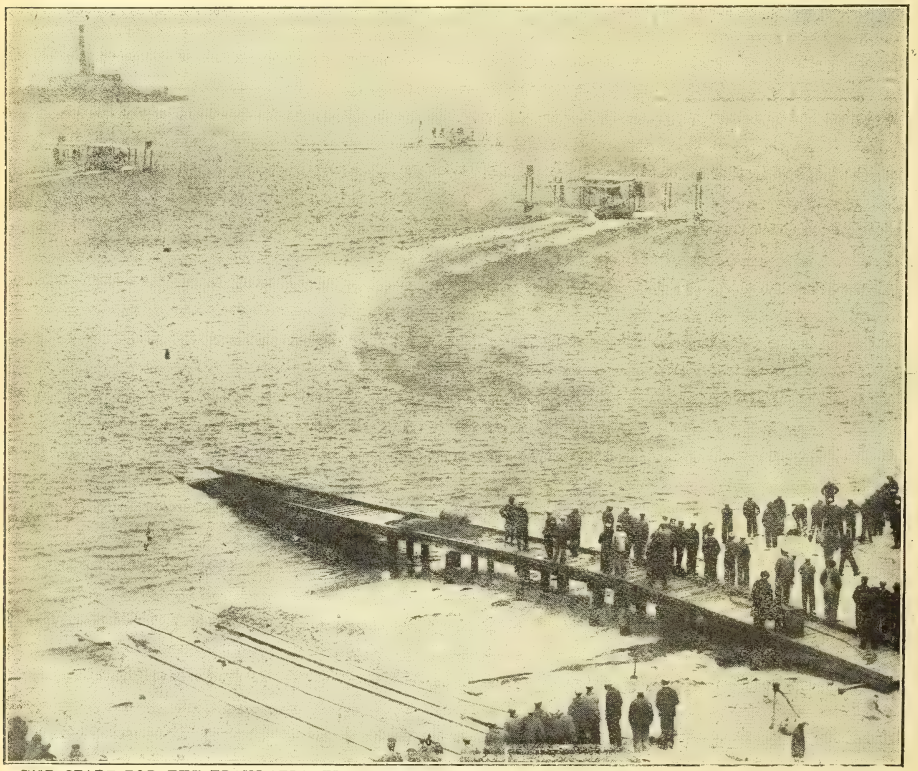
The applied science of aeronautics which has been embodied so well in the N.C. boats is due to certain able young officers of the Department of Naval Construction, one of whom at least, Mr. Jerome Hunsaker, is known to all aeronautical scientists as a pioneer of their particular work. Mr. Hunsaker was recently in England, and, like Mr. Curtiss, he won the esteem of all who met him. He has practical horse sense, as well as a sense of humour in full working order, which relieves his deep and wide scientific knowledge of any charge of being academic. So far as the science of aeronautics goes, Mr. Hunsaker and his coadjutors are in no way behind their European contemporaries, and it is not due to any fault of theirs that Military Aeronautics in the United States proved to be the great washout of the War.

It is a lamentable fact that, despite all the newspaper talk about what the American Air Fleet was going to do, not a single American "airplane" crossed the lines during the war. Her brave but unskilled aviators fought and died on second-rate or obsolescent French and British aeroplanes. The history of the combined graft and incompetence which caused this unhappy state of affairs is still being investigated in America, and it will be time enough to tell that story when the truth is known. But it must be set on record here, for the honour of the U.S. Navy, that naval aviation in the United States has been the one bright spot in the sad history of the nation's aeronautical efforts. Which is precisely the opposite to our own case.

The Moving Spirit.

The man who has been the moving spirit in this success is one Commander John Towers, U.S.N. Long before the war Lieut. Towers, as he then was, learned to fly and was known as a first-class pilot. When war broke out he was Extra Naval Attaché at the American Embassy in London.

Though the United States showed no signs of coming into the war, none regarded John Towers as anything other than an Ally, and he was treated as such even by highly placed official personages. Whatever knowledge of Naval aviation was gained while he was in England was known to him, and one believes that his far-sighted and acute mind was of distinct service to us in our early war efforts. If he was not legally an Ally, he was, at any rate, a very friendly neutral.



THE START FOR THE TRANS-ATLANTIC FLIGHT.—The start from Rockaway Beach on May 8th of the three Navy-Curtiss Flying-Boats, N.C.1, N.C.3, and N.C.4.

When he returned to the States, much to the regret of many friends in England, he devoted himself to making the U.S. Naval Air Service the most efficient branch of his country's service. And those who know anything of the work of this arm in the war will be the first to recognise the success of his endeavour.

The U.S. Naval Air Service, unlike the Army's air branch, was excellently organised, well equipped, and well trained, and if the war had lasted only a little longer it would have made itself a big name in bombing over land as well as in operations at sea.

The Work of the U.S. Navy.

When the Armistice came, the U.S.N.A.S. determined to attempt the Atlantic crossing. It had the fullest support of the U.S. Navy, a Service in which, unlike our own, modern ideas find ready reception. The U.S. Navy laid itself out to help the Air Service people, and gave to the Atlantic flight the importance of Naval Manœuvres.

The benefit to the U.S. Fleet of the lessons learned in co-operating with the squadron of N.C. boats scarcely needs explanation. But, for the good of those who still believe in the pre-eminence of the British Navy, it seems worth while to point out that the practice thus obtained in keeping station on the line of flight, in taking signals from and sending signals to seaplanes, in searching for the missing boats, and in general co-operation over such a vast area has given the U.S. Navy experience of a kind which our own Naval people have not had.

The whole business was a triumph of good organisation, and the excellent way in which that organisation worked is evidence of the keenness and efficiency of the U.S. Navy, which deserves every congratulation. One regrets that Commander Towers in N.C.1 was unable to complete his journey by air, but he will be the first to congratulate Lieut.-Commander Read on his success, and he himself may be very well content with the honours which he has won as the man who inspired and organised the defeat of the Atlantic.

An Apology Due.

One feels that an apology is due to the U.S. Navy and to the American people for the indifference or ignorance displayed by the British Press in the matter of America's victory.

The arrival of N.C.4 at Lisbon, which completed the defeat of the Atlantic whether she continued her flight to England or not, was chronicled as a bald fact without comment, and occupied perhaps three or four inches of space in the leading papers. Yet the same papers were devoting columns to descriptions of the hysteria of London's apparently unemployed population over the return of the two British aviators who failed so gallantly to get across.

Probably the American Service people were glad to escape the gush and slush which poured forth so fulsomely over their unfortunate rivals. But one feels that it was at least the duty of the more sound and responsible papers—a duty to the British Public rather than to the American People or the U.S. Navy—to have produced at least a respectable leading article pointing out for the benefit of those who are incapable of thinking for themselves (the vast majority of readers of daily papers) that the Atlantic had suffered its first defeat.

For, be it noted, though it must be a long time before we win the Command of the Air over the Atlantic as we won the Command of the Air over Hunland during the present war, this crossing of the Atlantic by N.C.4 is the first step towards complete ultimate victory in the world-long war which is being waged by man against the so-called elements—earth, air, fire, and water.

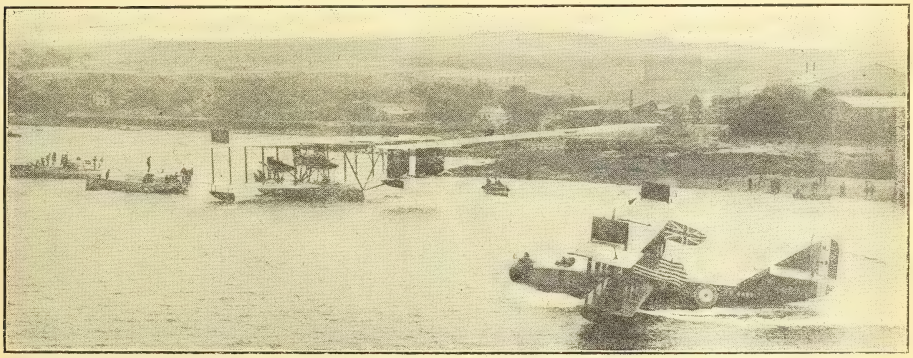
The American Nation must not take the attitude of the British Press as indicating the attitude of the intelligent minority of the British people. Still less does it indicate the attitude of those concerned with British aeronautics. Still less again does it indicate the attitude of the King's Services—which probably count for more than all the rest in the eyes of the U.S. Navy.

Now that N.C.4 has reached England her crew has been overwhelmed with adulation by the British Press—now that the said Press has been reminded of what is expected of it by the people most concerned. But no amount of slopping over can wash out the fact that the British Press did not appreciate the significance of N.C.4's victory when that victory was won.

The Explanation.

America must accept the apologies of the aeronautical section of the British Public, and one would merely ask that the remissness of our Press be set down to pure ignorance and not to malice. It has never occurred to any of our newspaper magnates that the British Public will take the very best of anything as eagerly as it will swallow the very worst. They only know that it is not interested in what is merely clever. Consequently it has never struck any of them to build up a newspaper staff composed entirely of intelligent educated gentleman.

In fact, if one meets a man who is either intelligent, educated, or a gentleman, on the staff of a British Paper, as one does occasionally, one asks oneself what he is doing in this galley. Probably our American friends will understand the situation if this is pointed out to them, for one gathers that the American newspapers



THE END OF THE TRANS-ATLANTIC JOURNEY.—N.C.4 at her moorings in Plymouth Sound, with one of her escort—a British Flying-boat—coming up astern of her.

suffer in much the same way, except that they are not so entirely devoid of intelligence.

One British newspaper man made the excuse, more or less for all the Press, that the crew of the N.C.4 had sold their "story"—as Press slang has it—to an American paper, and refused to tell anything to the journalists at Lisbon. The American paper—according to him—was trying to sell the said story at 500 per cent. profit to any paper that would buy the rights for this country.

The yarn may be true, though one prefers to think that Service reticence prevented the N.C.4s from talking till told to do so by their Navy Department. But even if true in its entirety, there is no excuse for the way in which the whole British Press belittled the flight to Lisbon by simply treating it as an ordinary news item.

The Press which can make nothing out of a great event unless it is accompanied by that species of guff which newspaper men and "movie" people call "heart interest" must be in a pretty poor way. And perhaps we in this country, with our sloppy Teutonic sentiment, have the newspapers and the politicians which we deserve.

Britain's Modest Part.

But perhaps after all we as a nation, in this effete old country, may take upon us a modest share of reflected glory from this great victory. The United States Navy is to a very great extent the direct descendant of the British Navy, and the American people are our blood relations—seeing that the bulk of them are of either British or German descent. Also, they speak the same language, "albeit"—as a humorist has said—"through a different feature."

Further, it may be remembered that, when the first multiple-engined Curtiss boat was a-building for the trans-Atlantic flight in 1914, the pilot was to be a certain Irish ex-lieutenant R.N.—by name John Porte—invalided from His Majesty's Service. Lieut. Porte (now Colonel John Porte, C.M.G., R.A.F.) worked with Glenn Curtiss on that boat, and to him were due—thanks to his knowledge of the sea and to its evil ways—certain improvements in hull-bottoms, which made all the difference to the "unsticking" of the boat from the water.

Those improvements have been developed with later experience, and from that boat descend not only the N.C. boats, but all the "Americas" and Porte Boats and "F" Boats of the R.N.A.S. and the R.A.F. right up to the "Felixstowe Fury," which would herself have flown the Atlantic ere now—as intended by Lord Weir—if the British Navy had had the imagination, the energy, and the initiative of the U.S. Navy.

Also it is worthy to note that, unlike all other existing flying-boats, the N.C. boats do not carry their tails on an elongation of the hull, but on tail-booms, precisely in the manner originated in the Sopwith "Bat-Boats," a type in which one believes firmly, in common with many experienced Naval aviators. Along further modifications of this idea—coupled with Caproni practice—much future development may come. But meantime the "Bat-Boat" influence in the N.C. boats seems fairly obvious.

Lastly, perhaps one may hope that the residence of Commander Towers in this country may have taught him something about Naval aviation which he would not have learned if he had remained in America, and that thus our hard-won early war experience—most of which seems likely to be wasted by an obtuse Naval Administration—may have helped him somewhat in the great task in which he has succeeded so admirably.

If we could not succeed ourselves, we may as well try to make out that some of the credit for success belongs to us.

And Afterwards?

And now what next? The Atlantic has been crossed by air. We have lost the honour of being first across.

There seems to be but a modified glory to be had in being the first to do a non-stop flight. So long as one can get from one place to another in any given vehicle, it matters little whether one stops for a drink on the way or not.

It is probably a recognition of this fact rather than financial or any other considerations which decided Mr. Sopwith in refusing to back Mr. Hawker and Lieut.-Commander Grieve in a second attempt to cross.

After the first non-stop journey we shall begin to introduce an illimitable series of minor classes in the competition. We shall have the "first one-man flight," then we shall have the "first flight with one engine," "the first flight with two engines," "the first flight with four engines," "the first flight with one passenger," "the first flight with ten passengers," "the first flight with fifty passengers," "the first flight with a woman passenger," and so forth and so on, *ad infinitum*.

The thing that really counts is being first across. And that honour has gone to America.

The Commercial Incentive.

But stay! There remains Lord Northcliffe's £10,000 to be won. Here at any rate, though the Glory is departed from Israel, so to speak, we of this country have a commercial incentive to make further attempts. These may be either non-stop efforts, or may include a stop at the Azores for refreshment *à la Americain*.

Doubtless the consequent advertisement will make the attempt worth while, though one doubts whether even the *Daily Mail* will be able to work the whole British people up to the fine full fury of national hysteria which it achieved last week. Nevertheless one wishes well to all who may brave the air and sea in the cause of British Commercial Enterprise.

Our One Consolation.

The great saving consolation to our national honour in this regrettable defeat is that our representatives should have pushed off from the friendly fields of Newfoundland, in spite of adverse weather reports, the moment they heard that their American competitors had reached the Azores. The honour for this act is shared equally by Mr. Raynham and Major Morgan with Mr. Hawker and Lieut.-Commander Grieve.

The fact that Mr. Raynham crashed on the dry land and Mr. Hawker in the wet sea indicates no difference between the physical and moral bravery of the two crews. Both were "ready at their country's call," as it were. And both did their best. One cannot expect that any reward will be given to Mr. Raynham and Major Morgan, for they failed to raise the Nation (*via* the *Daily Mail*) to such a pitch of anxiety as surpassed even that which was felt for our Army in France during the critical days of the Great Retreat, the Battles of Ypres, or the Defeat of March 1918.

Nevertheless in the minds of all thinking people the honour is equally divided, even if the proceeds are not. Such is the fortune of war, and of peace. Mr. Hawker and Lieut.-Commander Grieve have at least earned their £5,000 and their Air Force Crosses—albeit one has been, hitherto, under the impression that the Air Force Cross was intended for officers of the Royal Air Force only, and not for civilian aviators.

If it is to be given to civilian aviators one can indicate at least two or three others who deserve it as well as or better than several of the officers of the R.A.F. on whom it has been conferred. Certainly Mr. Hawker deserves it thoroughly well, if it is to be given to civilians, for his work as a test pilot even before he attempted the Atlantic passage, so that none can grudge it to him in

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spite of the errors of those Members of Parliament—including Major-General Seely, Under-Secretary of State for Air—who referred to him with fine indiscrimination as Major Hawker and Captain Hawker, doubtless confusing him in their limited minds with that gallant officer, the late Major Lanoe Hawker, V.C., D.S.O., who fell a victim to the late Captain Baron Manfred von Richthofen in 1916.

The One British Success.

The only other consolation to our national pride is the fine feat of navigation performed by Lieut.-Commander Grieve. It has always been doubtful whether it was possible to navigate an aeroplane successfully over open sea, but Commander Grieve has now proved the possibility beyond doubt, and under the most adverse circumstances. To him we owe whatever of real tangible value is to be acquired from the flight. One hopes that he will make his methods and his actual work during the voyage known to the aeronautical community. One suggests that a paper by him, written or read to the Royal Aeronautical Society, would be the fit and proper method of imparting this knowledge.

The Ultimate Link.

Still, one swallow does not make a Summer, and one trans-Atlantic flight does not make a commercial air service. We are still far from that regular service of aircraft across the Atlantic which shall be the ultimate link in binding together the two great branches of the Teuto-Latin Races and consolidating them against the Yellow Races. Such a service will come in due time, either by airship or aeroplane, probably by the former at first. But it will only come as the result of regular overland and short-sea services, and not by continuous trans-Atlantic attempts.

When it comes it will depend for its success upon perfect organisation and not upon slap-dash gallantry. So that like the first crossing of the Atlantic it may fall to the skill and organising power of America. If so, as in the present matter, honour be to whom honour is due.

C. G. G.

THE AMERICAN OCEAN-GOING FLYING-BOATS.

By "Austerlitz."

The ocean-going flying-boats which the U.S. Naval Air Service fitted out for the crossing of the Atlantic *via* the Azores belong to the so-called "NC" class of machines, which has been developed by the Curtiss Engineering Corporation at their Garden City works to the designs of the Aircraft Division, Bureau of Construction and Repair, Navy Department. Hence the official designation NC, which stands for Navy-Curtiss, and not for Nonpareil Colossus—as an ingenious-minded individual suggested.

The officers chiefly responsible for the design of the NC boats are Comdr. G. C. Westervelt, Lieut.-Comdr. H. C. Richardson, and Lieut.-Comdr. J. C. Hunsaker, of the Construction Corps, U.S.N.

The Trials of the NC1.

The first of these boats, the NC1, made her initial trial flight on November 8th of last year, when she carried a complement of fifteen from Rockaway Naval Air Station to Washington, D.C., and later in the day flew from the national capital to Hampton Naval Air Station. All those concerned with the construction and operation of the boat were highly elated over these flights, for, despite a certain sluggishness experienced in the take-off, the huge boat proved quite manageable in other respects—not a mean achievement, if one considers that the NC1 (as she was then) weighed, fully loaded, a matter of 11 tons. A high speed of 81 m.p.h. was developed during the trials, and an altitude of 2,000 feet was reached in about 10 minutes.

To Be or Not To Be a Flying-Boat.

As may be seen from the accompanying illustrations, the NC boats divert from customary practice in that the tail surfaces, instead of being fitted to the stern of the hull, are carried on three outriggers, with consequent short-hull construction, which brings us back to the venerable days of the Voisin "Icare," the Sopwith "Batboat," and the Colliex-Janson tandem seaplane.

The object of this construction is to reduce the frictional resistance which a flying-boat develops on the under-side of the hull while taxying to take off, with a consequent slowing down of the starting speed. Now in a rough sea the take-off is in general accompanied by "porpoising"—that is, by striking the crest of each succeeding wave as the boat gathers speed and is already partly supported by the air. This is not only exceedingly uncomfortable for the crew, but also puts the hull to often dangerous strains. Any shortening of the get-away distance is therefore exceedingly desirable for the safe operation of seaplanes, and the short-hull construction appears to answer well this requirement.

Unfortunately, owing to its smaller excess of flotation, it introduces a certain longitudinal instability when afloat, and affords less protection to the tail group than a long-hull flying-boat. This explains why on small flying-boats the short-hull construction has not found great favour thus far.

Owing to their type of construction, the NC boats are often referred to as a compromise between the boat and float type seaplanes, although, were a precise definition wanted, a flying-boat may be described as a sea-going aeroplane which affords accommodation to the crew in a hull ensuring flotation. Consequently long and short hull seaplanes may both be considered as flying-boats "pure and simple."

Physiognomy and Anatomy.

The hull of the NC1 has an overall length of 44 ft. 8¾ ins., a beam of 10 ft., and an overall height of 7 ft. 5½ ins. It is of the straight V-bottom type, with a single step located 18 ft. 2 ins. from the stem. Unlike the Felixstowe and the American F boats, the NC1 has no fins flaring out on either board, but is nearly semi-circular in cross section.

The hull is built up around a keel and four longerons of white ash, with veneer bulkheads; keelson and stringers are of basswood. The planking is composed of an inner skin of Port Orford cedar, placed at right angles to the keel so as to act as a strength member, and an outer skin of Spanish cedar, with Courtrai fabric laid in marine glue in between, and secured to one another by brass nails. The step is reinforced by mahogany veneer.

The wings are composed of a centre section of 25 ft. 4 ins. span and outer sections of 44 ft. 4 ins. (upper) and 35 ft. 4 ins. (lower) span, with a uniform chord of 12 ft. Including the balanced portion of the ailerons, the span of the upper wings is 126 ft., and that of the lower wings 96 ft.; the interplane gap is 13 ft. 6 ins. at the centre section, whence it decreases towards the tips to 12 ft. because the lower outer sections are set at a dihedral of 3 deg. The angle of incidence of both wings is 3 deg.; there is no stagger or sweep-back.

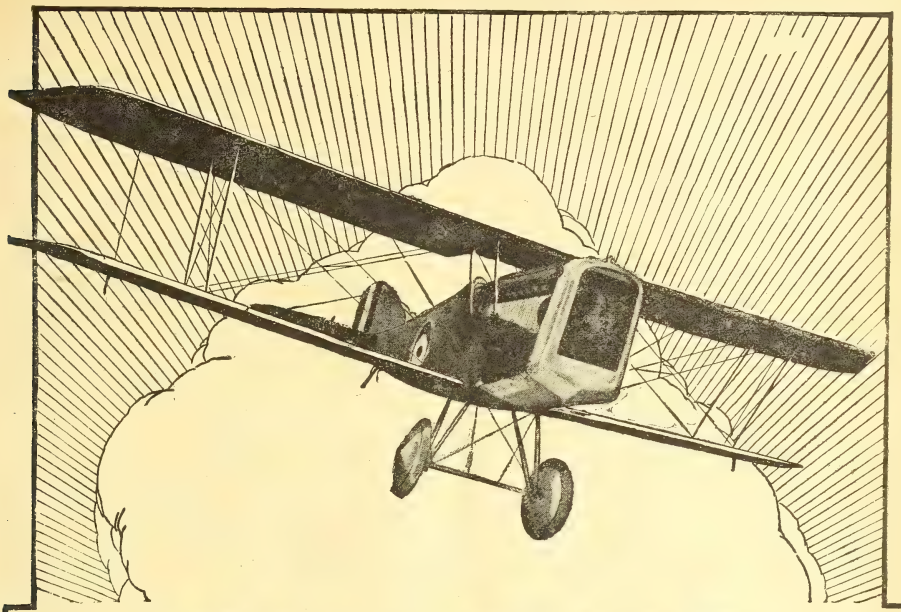
Ten bays of interplane struts secure the wings to one another; six of these occur in the centre section, where they serve in pairs as engine supports. Where the outermost interplane bays abut against the *cellule*, a vertical drift plane is fitted to the upper wing, and a streamline balancing float is secured to the lower wing. The *cellule* is extensively trussed by swaged wires.

The power plant consists of three Liberty-12 engines of the low-compression Navy type, which develop each 330 h.p. at 1,590 r.p.m., and actuate a four-bladed tractor airscrew of 10 ft. 10 ins. diameter by direct drive. The engines are mounted in streamline *nacelles*, which are secured to the interbays of the centre section; the centre engine *nacelle* is fitted with a cockpit for a mechanic, to which access is had from the boat by means of a scaling ladder.

The outriggers which carry the tail unit are of hollow spruce and form a pyramid-like structure, the base of which is attached to the upper rear wing spars and the stern of the hull, while the truncated apex affords the points of attachment of the biplane tail. The latter is composed of an upper tail plane of 47 ft. 11 ins. span, and a lower tail plane of 26 ft. span, set at a gap of 9 ft. 3 ins., to which are hinged balanced elevators. Three rudders are fitted in the tail *cellule;* the central is balanced, but the outer rudders are hinged to a vertical fin.

The Crews.

The normal complement of the NC1 consists of five officers and sailors, two of the officers being pilots; these are seated side-by-side in a cockpit fitted amidships and provided with dual control and the necessary instruments. A gunner's nest is fitted in the bows, and another was originally provided for in the middle of the upper wings, with access through the



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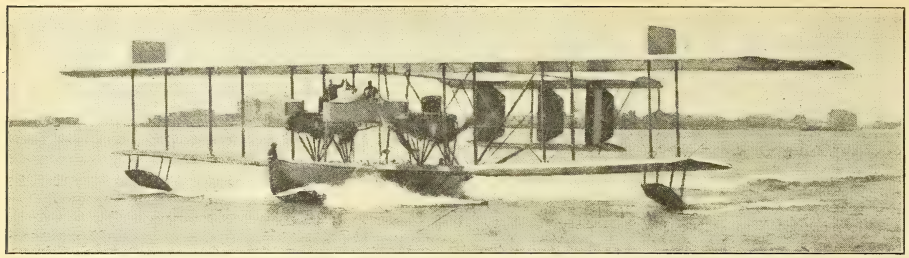
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THE NON-STARTER.—N.C.2, which differed from the rest of the series and was not used—for reasons given below.

centre engine nacelle; the wing gun emplacement has, however, been removed, in view of the attempt to cross the Atlantic.

The fuel tanks contain about 300 American gallons of petrol, which is sufficient for a continuous flight of 13 hours. The disposable load is 7,750 lbs., and the full flying weight 21,560 lbs.

A More Powerful Sister.

When, to quote a Presidential proclamation, "the war came to an end" with the signing of the Armistice, the Navy people at once made extensive plans to carry off the palm of the first crossing of the Atlantic. With the experience gained in the operation of the NC1, three more boats of this class, but of an improved type, were laid down at the Curtiss works in Garden City, L.I., and Comdr. John H. Towers, U.S.N., the veteran American naval flyer, was ordered by the Navy Department to take charge of the organisation of the ocean flight. At the same time Rockaway Naval Air Station was designated as the American starting-place of the flight.

The second of the NC boats, NC2, made her maiden flight on April 12th, at Rockaway. Except for her power plant, which consists of four Liberty-12 engines arranged in tandem sets, with each set driving tractor and pusher airscrews, and the fitting of a pilot nacelle in the place where the NC1 had her central engine, the new boat is identical with her older sister.

The wing area is the same in the two boats—2,380 sq. ft.—but the NC2 has shown in trials to have a loading efficiency of 47 per cent. as against 36.4 per cent. for the NC 1, although, owing to her fourth engine, the power loading of the NC2 is only 17.9 lbs./h.p., as compared with the 22.2 lbs./h.p. of the NC1.

It is true that as a consequence of the greater load carried—28,500 lbs. in flying trim—the wing loading has jumped from 9.1 to 12 lbs./sq. ft., an unusually high figure, judged by contemporary standards.

During her initial trials the NC2 took off after a 35 seconds' run (7 seconds better than the best performance of the NC1), and developed a high speed of 95 m.p.h., but both tests were made in "light" condition.

Since then the boat has lifted a total weight of 28,500 lbs., of which, it was believed, about 11,500 would be available in fuel for the trans-Atlantic flight.

However, the NC2 was not destined to participate in the grand adventure. Among the reasons given for this decision of those in power is the belief that the tandem arrangement of the engines is not conducive to best efficiency, because the pushers work in the slip-stream of the tractors, while the operation of machine with both engines of either board cut out also appears a somewhat questionable proposition. Finally it is realised that the pilot nacelle unnecessarily increases head resistance, while certain misgivings are felt with regard to the advisability of having a worn-out pilot climb down the scaling ladder with a wind of 90 m.p.h. doing its utmost to blow him off.

The Rebuilt NC1.

Consequently it was decided that the NC2 should shed her wings, or rather the outer sections, so they might be fitted to the NC1, which had her wings damaged by a storm, and that the power plant of the latter boat should be modified to conform to the practice followed in the NC3.

The latter, which made her maiden flight on April 23rd, was fitted with three tractor airscrews, with engines arranged as in the NC1, but had besides a fourth engine, actuating a pusher, mounted tandem fashion with the central engine. This arrangement is believed to permit a much more efficient utilisation of the power plant, as airscrew interference can in the worse case extend to only one of the power units, while the possibility of an offsided pull is reduced from one-half to one-third.

This was well brought out during the initial flight of the NC3, marked by the antics of the starboard engine, which balked, despite the most strenuous efforts of the crew.

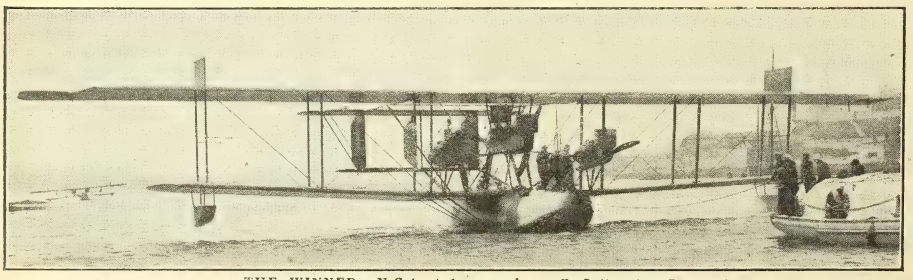
In spite of this handicap, the NC3 displayed great stability (in light condition it is true) during her trials, and great satisfaction was felt by the Navy people over this vindication of their views. Afterwards the NC3 was given a 2-hour sea trial, with a total weight of 29,500 lbs., for the purpose of testing her seaworthiness; this appears to have come off quite satisfactorily.

The NC4 was being assembled at the date of writing, and was expected to be put through her acceptance tests very shortly. With the latter completed, the three boats were to constitute NC Seaplane Division 1, which would attempt to cross the Atlantic under the order of Comdr. Towers. Among the officers named in naval circles as pilots of the boats were Lieut.-Commanders Read, Bellinger, and Mitscher, and Lieuts. McCullough, Barin, and Hinton.

Other Preparations.

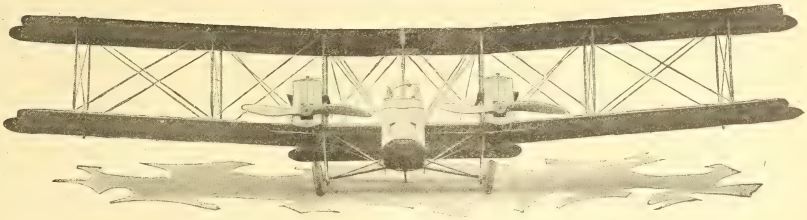
Shore parties of mechanics and sailors were sent to Trepassey Harbour, N.F., Horta (Azores), and Lisbon, to establish air stations. NC Seaplane Division 1 flew the so-called Southern course—that is, by way of Newfoundland, the Azores, and Portugal. There was 940 land miles from Rockaway to Trepassey Harbour, thence 1,230 miles to Horta, and 950 miles from there to Lisbon. The American boats did not follow the Northern or direct route, because their fuel tanks have insufficient reserve capacity for this purpose.

All three boats were equipped with radio direction finders and wireless sending and receiving instruments as well as with flame and smoke flares, which were to be dropped *en route* to ascertain the drift and permit due correction in the course.

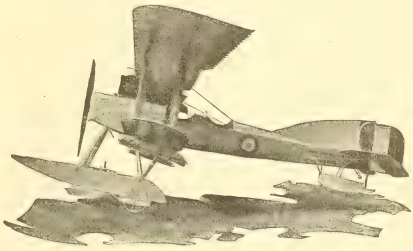


THE WINNER.—N.C.4 at her moorings off Cattewater, Plymouth.

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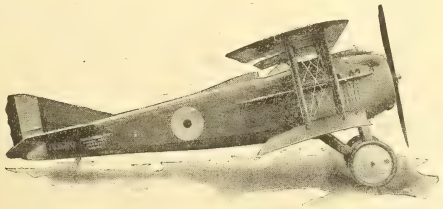
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THE REAL LESSON OF THE TRANS-ATLANTIC ATTEMPT.

By Capt. W. H. SAYERS, (late) R.A.F.

The wave of popular enthusiasm which has swept over this country on the occasion of Mr. Hawker's attempt to fly the Atlantic has obviously little to do with the actual nature of the achievement.

Regarded as an aeroplane performance, Mr. Hawker's flight of 1,200 odd miles in 12 odd hours cannot be compared in importance with his own flight of 8 hours 23 minutes at Brooklands on October 24th, 1912.

That was at least an achievement which put British-built aircraft and aero-engines amongst those which counted.

As a sporting event, Mr. Hawker's effort was undoubtedly a fine thing. There was no risk that the Americans would wrest the "Daily Mail" prize from him, and his action in starting under relatively unfavourable conditions can only have been dictated by the desire to be the first across.

This is why the British public has let itself go over Hawker.

The average Englishman has no ill-feeling towards his American cousins. He is properly grateful to them for the very great assistance they have afforded in the final stages of the great war, but he is, if anything, a little tired of the talk of a certain section of the American people whose main occupation recently has been that of boasting of the ultimate effect that the American methods of organisation would have had had the war lasted.

Therefore Hawker and Grieve's lone-hand effort to defeat the U.S.A. Navy's attempt won a certain added sympathy over and above that which would anyhow have been extended to anyone who took the risks they were taking.

Mostly, however, the demonstration must be traced to the desire to let themselves go over some really sporting achievement totally divorced from the associations of four and a half years of war.

On the whole, it is probably a healthy sign as to the state of mind of the British public.

But there is a grave danger that this attitude may lead to forgetfulness of the one really important aspect of this unsuccessful attempt at crossing the Atlantic.

As has already been suggested, neither the distance covered nor the duration of the flight is of any great importance as an aeroplane performance, or as a feat of endurance on the part of the pilot.

That any serious breakdown of the engine on this particular flight would place both pilot and passenger in grave danger is a tribute to their confidence in their machine and their audacity, but it has no serious practical significance.

But the fact that the flight was carried out over sea, with no fixed landmarks to serve as guides, relying entirely upon instrumental observation on the part of the navigator to keep to the correct course, and that the methods adopted did in fact prove successful is a matter of the very gravest importance.

The successful development of practical methods of aerial navigation is one of the most difficult of the problems to be solved in connection with the future of aerial transport.

Lieut.-Commander Mackenzie-Grieve has shown that even under very trying weather conditions it is possible to navigate an aeroplane across sea with the aid of instrumental observations with quite unexpected accuracy.

Commander Grieve is, of course, an experienced navigator, but he certainly can have no very large experience of this particular type of navigation.

One is without any definite information as to the type of instruments which he used for his observations, but it is known that very little has yet been accomplished in the direction of developing special navigation appliances for aeroplane use.

It is therefore reasonable to suppose that what Commander Grieve was able to accomplish on this occasion, with no accumulated experience of air navigation behind him, and with relatively crude appliances, will be possible for any decently trained aerial navigator within the next few years.

Purely as a step in the development of the aeroplane as a vehicle, Commander Grieve's work far outdistances in importance anything that now or ever will be accomplished by any mere flyer who simply flies a machine over vast distances.

This is spoken in no disparagement of the pilots of to-day, least of all of Mr. Hawker. They have done their work, frequently at a risk even more imminent and deadly than those faced to-day in an attempt to cross the Atlantic, in proving that the aeroplane is a practical mechanism.

But it is now the turn of the navigator, and it is for him, now that it is an ascertained fact that an aeroplane can fly, to show that he can direct it accurately to its intended destination.

The very fact that of the three American machines which attempted the Newfoundland-Azores flight, two having arrived within 200 miles of their destination were entirely unable to find it on account of fog, and that the successful N.C.4, after a run of 170 miles in fog, found herself 45 miles off her course is a very fair index of the importance of the navigator's art.

It is gratifying to note that this point has not passed altogether unheeded.

In a long letter to the "Times," published on Saturday, May 31st, Lieut.-Col. H. T. A. Bosanquet, late R.A.F., draws the attention of the general public to this aspect of the matter, and the following extracts therefrom are worthy of attention:—

"Before another trans-Atlantic flight is attempted by the direct route, may I be allowed space to draw attention to the navigational side of the venture? It appears, from the very secondary importance and credit that have been given to the navigator, that the general public has failed to grasp the overwhelming importance of correct navigation and its manifold difficulties in such a flight.

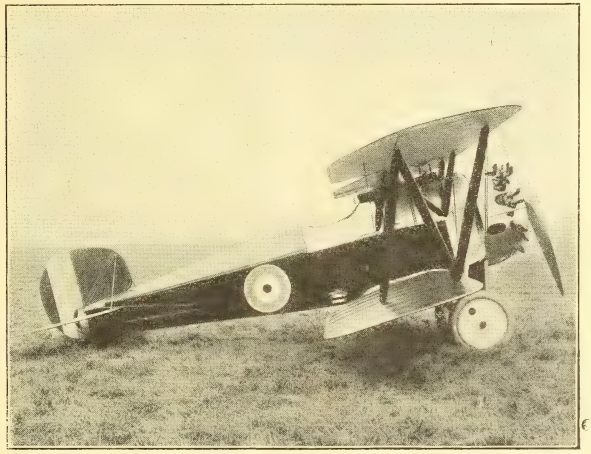
"The affair has merely been regarded as a sporting event somewhat similar to, but on a larger scale than, the first cross-Channel flight. The two things are not, however, comparable. . . . The trans-Atlantic venture is on a totally different plane, and for accomplishment calls for the highest technical skill and practical experience on the part of the navigator. Whereas it might be possible at this moment to pick out at least one thousand pilots from the R.A.F. qualified in skill, physical endurance, and courage to undertake this flight, on the other hand it is probable that the really competent navigators, possessing the technical navigating knowledge, combined with the equally necessary practical experience of long over-sea flights, could be reckoned on the fingers of one hand.

"It may be well to indicate some of the difficulties of the direct route from St. John's to Ireland. The distance is about 2,000 land miles, and if the objective is to be safely reached the aircraft should be able to fix her position, more or less correctly, at intervals of not more than one hour or about every 100 miles—bearing in mind that an initial error of only 5 deg., if persisted

10,000 FEET IN 5 MINUTES 25 SECONDS

AT FARNBOROUGH IN APRIL, 1919, A BRISTOL SCOUT FITTED WITH A "MERCURY" ENGINE CLIMBED 10,000 FEET IN 5 MINS. 25 SECS., & 20,000 FEET IN 16 MINS. 15 SECS., SPEED AT 10,000 FEET 143 M.P.H. OFFICIAL CORRECTED BAROGRAPH FIGURES.

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20,000 FEET IN 16 MINUTES 15 SECONDS

in, would result in putting the craft some 150 miles to either side at the end of her run.

"There are three general methods of fixing positions (a) dead reckoning; (b) directional wireless; (c) astronomical observations, and in their present stage of development at least two of these should be available if the voyage is not to be one of pure hazard.

"As for the first, this depends entirely on the accurate determination of the drift and the speed of the craft over the earth's surface. When flying over land, especially at heights under 6,000 ft., some fairly accurate passages can be made, but in over-sea navigation, whether flying high or low, the most extraordinary errors can be made. . . . A good example is furnished by the U.S. N.C.4, which, on her way to the Azores, ran into fog and had to depend on her D.R. calculations for some 170 miles. When her position was again established by one of the route-marking vessels she was 45 miles out in her reckoning. In the Sopwith flight, Lieut.-Commander Mackenzie-Grieve found himself by astronomical observations about 150 miles off his course in a run of 900 miles. When such large errors are possible it is easy to see that any dependence on this method is out of the question.

"Directional wireless is still in its infancy. It has given the most promising results, and undoubtedly will be the method of air navigation in the future, but it is not yet sufficiently developed to be reliable. . . .

"Astronomical observations can be carried out from an aircraft as on board a seagoing craft, but with much greater difficulty and less accuracy. The sea horizon is not available, so that a cloud horizon must be used or an instrument having its own artificial horizon. Up to the present no really satisfactory instrument of the latter type has been designed, and the use of the cloud horizon is not always possible. Moreover, these observations in an aircraft demand a high degree of skill and practical experience on the part of the observer. So that it is only an exceptional man, and one who has long practised observing under difficult conditions at sea, who can make any real use of this method.

"Hence it becomes necessary to fall back on D.R. as the main principle, and naval expert opinion at the Air Ministry, certainly until quite recently, was to the effect that a trans-Atlantic flight dependent on this method only would be a highly hazardous undertaking. . . .

"One of these essentials is that the skill, knowledge, and experience of the navigator should be above suspicion. . . . I suggest that it is now the duty of the Air Ministry, as the Government Department most nearly concerned, to make careful inquiry into the credentials of the navigator in each case in this trans-oceanic business. Both the Admiralty and the Board of Trade allow no vessels coming under their respective departments to proceed overseas without a fully qualified navigator on board, who has been able to satisfy a board of examiners as to his knowledge and practical experience. Why should not the same be the rule for an oversea aerial voyage? . . ."

THE PEACE TERMS TO AUSTRIA.

The following are among the terms presented to Austria by the Allies:—

PART V.

AIR CLAUSES.

The Air clauses provide that the armed forces of Austria must not include any military or naval air forces. The entire personnel of the air forces in Austria is to be demobilised within two months.

The aircraft of the Allied and Associated Powers are to enjoy full liberty of passage and landing over and in Austrian territory until January 1st, 1923, unless prior to that date Austria is admitted to the League of Nations or is permitted to adhere to the International Air Convention.

The manufacture of aircraft and parts of aircraft is forbidden for six months.

All military and naval aircraft (including dirigible and aeronautical material) are to be delivered to the Allied and Associated Governments within three months.

PART XI.

AERIAL NAVIGATION.

Aircraft of the Allied and Associated Powers shall have full liberty of passage and landing over and in Austrian territory, equal treatment with Austrian aeroplanes as to use of Austrian aerodromes, and with most-favoured-nation aeroplanes as to internal commercial traffic in Austria. Austria agrees to accept Allied certificates of nationality, airworthiness, or competency and licences, and to apply the convention relative to Aerial Navigation concluded between the Allied and Associated Powers to her own aircraft over her own territory. These rules apply until 1923, unless Austria has since been admitted to the League of Nations or to the above Convention.

AN ACCIDENT TO LORD LONDONDERRY.

Lord Londonderry and Brig.-General Vyvyan, R.A.F., met with an accident on May 31st while flying from Tadcaster to London. Both escaped with a severe shaking, but Lord Londonderry was able to catch a train for London the same day.

The machine, a Bristol Fighter, piloted by Gen. Vyvyan, was compelled to land at Charlton, Selby. The landing was made in a boggy field and the machine charged a fence, part of which was carried away, turning the aeroplane into a dyke.

CONGRATULATIONS.

In its proper place in the Military Column appears the official announcement of the engagement of Major-General E. B. Ashmore, C.B., C.M.G., M.V.O., to Miss Betty Parsons.

All who are concerned with the Royal Air Force and with Aeronautics will join in congratulating General Ashmore on this happy event, and will wish him and his bride-to-be an amount of happiness equal to that which General Ashmore himself has conferred on the inhabitants of London and the adjoining counties by his able command of the London Air Defence Area. Probably if the aggregate amount which he has conferred on some millions of people is divided up between the two it will suffice very comfortably for any two human lifetimes.

A DESERVED HONOUR.

The "London Gazette" of June 2nd announces that the King has been pleased on the occasion of His Majesty's Birthday to approve of the honour of Knight Bachelor being conferred on the following gentleman:—

Charles Bright, Esq., F.R.S.E., M.Inst.C.E.

Sir Charles Bright will be remembered as a most active member of the Air Inquiry Committee of 1916, when his auxiliary report brought to light a number of important points on which the Government afterwards took the necessary action. He also made numerous suggestions which were evidently of use to the Civil Aerial Transport Committee of 1917.

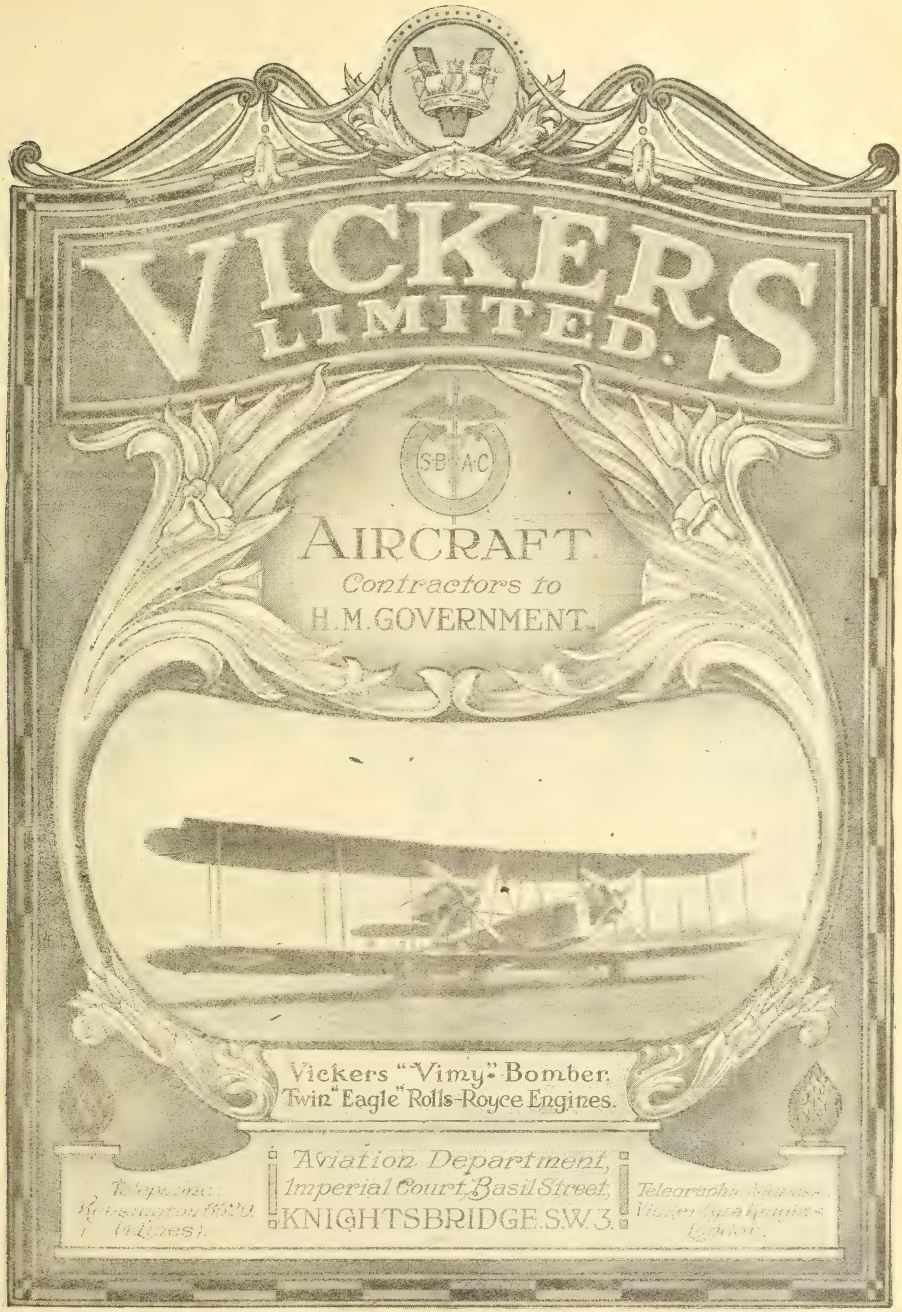
Sir Charles is one of the earliest members of the Royal Aeronautical Society, and is the son of Sir Charles Bright, the brilliant engineer, who was responsible for the laying of the first trans-Atlantic cable. All will be glad to see this honour conferred upon him as a reward for his good work in the cause of aviation in general and of the R.F.C. in particular.

A SOUND APPOINTMENT.

One notes with pleasure the fact that Major C. C. Turner, A.F.R.Ae.S. (late R.A.F.), has been appointed Editor of that old-established journal, "Aeronautics."

Major Turner was known for years before the war as the writer of a weekly column of aeronautical notes in the "Observer" at a time when the general public cared but little for aviation and when the British Press cared less. His articles were always well written, his opinions were always sound, and his information was always reliable.

One wishes him every success in his new undertaking, and one congratulates the proprietors of "Aeronautics" on having secured so able an Editor for their paper—which, if one is not mistaken, is the oldest of all existing aeronautical periodical publications.


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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

On Dollars and Dimples.

An American technical journal which supplies a weekly review of everything from dimples to dope, publishes the following :—

"Dorothy Dalton, whose dimples and smiles have charmed millions in Thomas H. Ince productions for Paramount pictures, achieved the distinction of being the first lady passenger to travel by hydro-aeroplane from Keyport, N.J., to Albany, N.Y.

"Miss Dalton and her pilot, C. J. Zimmerman, came near making the world's record for slow flying. This, however, was because whenever Miss Dalton spied anybody down on the ground who looked as if he had the price, she would alight and sell him a Victory Loan bond."

One wonders at what altitude Miss Dalton flew in order to see which one of her intended victims "looked as if he had the price."

As, presumably, the hydro-aeroplane could only alight on water, one wonders if the plutocrats were bathing, in which case it appears that it would have been difficult to discriminate between the dollared and the undollared, unless the modern American munitioneer wears a fur collar on his bathing costume.

Or did she bring the dimples and smiles that have charmed millions to bear on yachtsmen only? One would like to know more.

The Gravity of the R.33.

The "Daily Mail" stated last week that :—

"One of the largest airships in the world rose from her moorings at the Barlow Works, Selby, and started on an eight-hour experimental cruise in ideal weather yesterday. She was the R.33, of whom so much is expected.

"The ascent was made without a hitch.

"At the last moment, when the ship was off the ground, the commanding officer called for more ballast, and two agile navvies clambered up the ropes in fine style, in this way restoring the gravity of the vessel to proportionate terms."

One wonders what the writer means exactly by "restoring the gravity of the vessel to proportionate terms." Does he imply that the sight of the agile navvies clambering up the ropes made it indulge in unseemly levity?

In a Chastened Spirit.

According to the "Daily Chronicle," a fantastic letter, addressed to a sober Government department, was read last night by Mr. H. Pike Pease, M.P., at the annual dinner of the Head Postmasters' Association.

The letter, from a munition-making firm, was addressed to the Ministry of Munitions, and stated :—

During this great war we have done many things that aforetime we had considered almost impossible. We have turned our ploughshares into swords, made night into day, made bricks without straw, turned water into wine, and ale into compound for the refreshing of labour.

We have resurrected machine tools, and taught them to rise and sing; we have imported proud Americans, we have salvaged destitute Belgians

We have gathered in and utilised barbers, circus proprietors, aboriginals from the Antipodes and some of the "Best People."

We have made women into mechanics and mechanics into supermen such as may be found at the Ministry of Munitions. We have diluted our labour, both male and female, until we have workers of the combined sex and of neither sex.

We have honoured the King and strafed his enemies, but we stand to-day hopelessly cast down by your suggestion that we should cut 2-inch Module pitch aeroplane engine gear with 2¾-inch Module cutter.

The original letter was published in THE AEROPLANE something like two years ago, but it is well worth publishing again, if only to acknowledge on behalf of Mr. Pike Pease the source of his humour.

Style.

The following is an example of how not to advertise :—

"Pilot with more than five years' experience both here and abroad, wishes position as pilot for private or liable factory. I have flown over 50,000 miles, in the daytime and at night."

It reminds one of Smith Minor, who wrote : "Mr. Smith presents his compliments to Tom Brown, Esq., and informs you I cannot accept his kind invitation as I have another I like better."

And, by the way, what is a "liable" factory?

A Freak Wedding.

A wedding in an aeroplane was celebrated on May 31st at Houston (Texas). Lieut. W. R. Meade and Miss Marjorie Dumont were married in a Handley Page machine 2,000 feet in the air.

A wedding party of 12, including the Rev. J. E. Rees, who performed the ceremony, flew in the machine.

One may now expect a new series of height records. The American bride who was married at an altitude of 2,000 feet will find herself eclipsed by another who is so anxious to have her name and photograph in the papers that she will modestly retire to a height of 18,000 feet above the clouds that form her wedding veil. An enraged parent endeavouring to forbid the banns from a pursuing Camel would add to the piquancy of the situation.

One so often finds reason to criticise the daily newspapers that one feels that in justice one must give credit to the journalists who refrained from the obvious comment on matches being made in Heaven.

Mimic Fighters.

According to an American general, "Fifty thousand persons watched the great mimic battles in Van Cortlandt Park, getting the most thrilling and vivid picture of how and why the Hindenburg line crumbled under the pressure of American fighters.

"One thrilling incident was when an observation balloon was sent up two thousand feet to report the 'enemy' doings and fire from the 'enemy' hit the envelope and set the balloon afire. Instantly its pilot was seen to jump off the basket, and as he did a large parachute opened up and carried Lieutenant Herbert H. Mills, of the 22nd Balloon Company, safely to the ground. This was the signal for the afternoon battle to start."

One is not told what happened to the pilot while the large parachute was carrying off Lieutenant Herbert H. Mills.

As to the mimic "pressure of American fighters," one has no doubt that it was wonderfully realistic.

"917."

"Nine one seven," 'tis the end;
Never more will you and I
Fly together, ancient friend,
Under clear or cloudy sky.
Comes a wetness to the eye,
In the throat a rising lump,
As I think how destiny
Sends you to the Salvage Dump.

Many a patch and cobbled rent,
Many an honourable scar,
Marks your might in tournament,
Vindicates your worth in war:
Flying fast and flying far
You have seen both friend and foe
Hurtle like a falling star
Twenty thousand feet below.

Not for you the splendid fate,
Mortal blow in mid career
And a death immediate,
Sudden and too swift for fear;
Days when danger was most dear,
Hours with glorious living crammed—
You survive and linger here
As "Unserviceable" damned.

You who spurned the upper air
And outpaced the wind in speed,
Now must follow wheresoe'er
Leyland lorry wheels may lead.
Humbled, like some warrior steed,
Bugle music in his heart,
Who, grown old and totter-kneed,
Ends upon the butcher's cart.

Clipped the wings that eaglewise
Bore you strongly up of old,
And your prop dismantled lies
And your cylinders are cold.
Yet in some far sky, I hold,
There's an aerobatic Heaven
Where, with joystick uncontrolled,
Stunts your spirit, Nine One Seven.

H. T. BURT.

TRANS-ATLANTIC FLIGHT.

The

Sopwith Rolls-Royce Biplane

used by

Mr. H. G. HAWKER

and Lieut.-Commander

MACKENZIE GRIEVE, R.N.

in their great attempt

was doped with

CELLON

(Scheme "A")

The WORLD of AERONAUTICS (continued)

Another Turbine, One Presumes.

According to a South African newspaper, "a Johannesburg engineer, Mr. E. P. M. Jerrard, claims to have invented a type of engine that will serve both as an aeroplane and a motor engine, and that will, if necessary, perform 40,000 revolutions per minute.

"One of the advantages of this invention is that, owing to its construction, when used for flying machines, it will enable the machine to lift itself vertically in the air without the usual running start, and also descend vertically to rest upon a pre-determined spot very little larger than itself.

"The great speed of this engine is adaptable for direct drive of the propellers, which are designed to revolve effectively at such speed, so that the dead-weight lifting power is more a matter of the power of the engines than of the shape or size of the wings, planes or aerostats."

One wonders what kind of airscrew would withstand the strain of being driven at the rate of 40,000 revolutions per minute. It would have to be of very small diameter, and one would imagine that it would be very inefficient.

In the matter of revolutions this engine certainly has Russia and the South American republics beaten to a frazzle.

Exclusive Information.

The "Daily Mail" recently referred to the Alliance-Napier "Seabird" as follows:—

"Fitted with a 40-h.p. engine, giving a speed of 140 miles an hour, the 'Seabird' is expected to cross the Atlantic in about 12 hours."

Apparently this engine must be a Napier "Lion" cub.

Regarding the time in which it is expected that the crossing will be made, an expert mathematician calculates that, if the "Seabird" flies at a speed of 140 m.p.h. for 12 hours, she will travel 1,680 miles, just 200 miles short of the distance from Newfoundland to Ireland, which is shown as 1,880 miles on the map published in the "Daily Mail."

This proves once more how misleading are figures, for the "Daily Mail" must, of course, have inside information, which is indicated by the fact that no other newspaper has yet mentioned the 40-h.p. "Lion" cub.

The Leeds Exhibition.

Lord Londonderry, in opening the R.A.F. Aircraft Exhibition at Roundway Park, Leeds, on May 31st, said that the activities of the Air Ministry with regard to exhibitions must necessarily come to an end. If aviation was to make progress in the future it must be on commercial lines. It was felt that the Government had no right to interfere with those firms who were anxious to extend their activities in developing the industry on sound commercial lines. Thus, so far as exhibitions were concerned, that at Leeds would be the swan-song. And very justly so.

The Royal Aeronautical Society.

The Society attained its Jubilee in the year 1916, but in consequence of the War it was at the time inadvisable to celebrate the event in any way. The end of the War, however, the fact that the Society has by command of His Majesty been dignified by the prefix of "Royal" and the fact that the Society has attained a membership of 1,000 and more, has determined the Council to mark the occasion by a gathering of its members and their friends.

By the kind permission of Mr. Handley Page a Garden Party will be held on the Cricklewood Aerodrome on Sunday afternoon, June 29th, from 4.0 p.m. to 7 p.m. Arrangements are being made for the entertainment and interest of those present.

The programme will include an exhibition of flying, opportunities for guests present to take flights, and an exhibit of various new types of machines. Handley Page, Limited, have kindly placed their works on view, and the Band of the Royal Air Force will be engaged for the occasion.

All applications for tickets must be made before June 19th to the Secretary, the Royal Aeronautical Society, 7, Albemarle Street, Piccadilly, W.1. The charge for admission, including tea, is 3s. for each person.

Flying Races at the London Aerodrome.

An interesting programme has been arranged by the Grahame-White Company at the London Aerodrome, Hendon, for the Whitsun Holidays.

Race Meetings will be held on Saturday and Bank Holiday, and it is interesting to note that this will be the first occasion, after a break of five years, on which Aerial Races have been held in England.

The course will consist of a series of circuits from the London Aerodrome to a point about two miles away; the machines will, therefore, be in full view of the spectators the whole time.

It is expected that there will be a large number of entries from the manufacturing firms who have been making machines during the war. Details of the races and prizes, etc., may be had upon application to the London Aerodrome (telephone—Kingsbury 120), where entries are being taken.

In addition to the races interesting displays on all types of machines will be given by pilots (late R.A.F.), and another feature will be parachute descents from machines travelling at over 100 miles per hour.

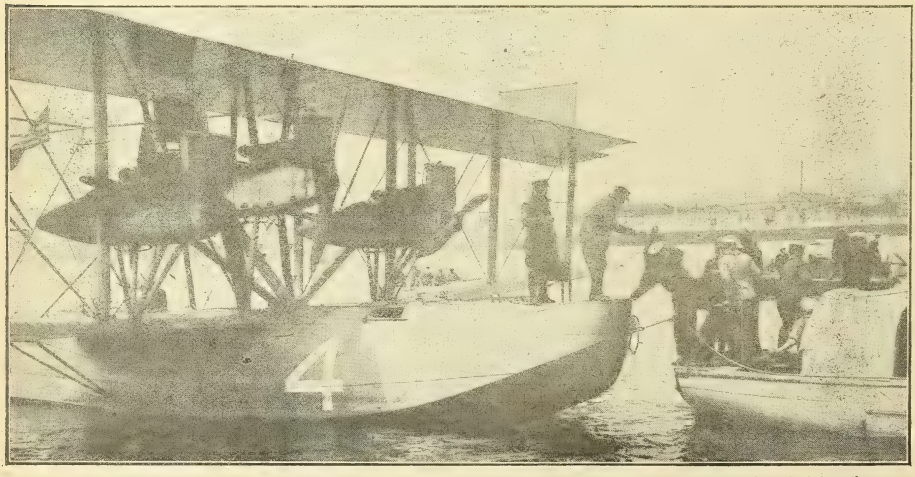
The Band of the R.A.F. will play from 3.30 p.m. until 7 p.m. on Saturday, Sunday and Whit Monday.

Speed.

The "Times" of May 26th published the following:—

Capt. Alcock, the Vimy pilot, lent his mechanics to Mr. Raynham to help in rebuilding the Raymor, and the Vimy, it is expected, will be allowed to fly from the Handley Page aerodrome. The day before the start it may fly light to Harbour Grace, fill up, and take off from there. This aerodrome is practically on the edge of the cliffs, and in a few seconds the machines will be over the ocean with the nearest land nearly 2,000 miles away.

The performances of a machine that can fly two thousand miles from its starting point in a few seconds will be worth watching.



The N.C.4 at Cattewater after her successful trans-Atlantic Flight. The arrangement of the four engines is interesting.

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THE

CENTRAL AIRCRAFT COMPANY'S

SCHOOL of AVIATION

under the personal supervision and management of

Mr. Herbert Sykes, O.B.E.

THE WELL-KNOWN TEST AND EXHIBITION PILOT

assisted by a large staff of qualified and experienced instructors.

Tuition on 75 H.P.

DUAL CONTROL "C.A.C." Tractor Biplanes,

the Finest Training Machines yet produced.

Applications for particulars as to Enrolment, etc., should be made to:—

The CENTRAL AIRCRAFT Company

179, High Road, Kilburn, N.W. 6.

The WORLD of AERONAUTICS (continued)

An R.N.A.S Dinner.

A dinner for officers who served at the R.N. Air Station, Eastbourne, in 1915 and 1916, will be held in London on Saturday, July 12th, 1919. Those wishing to attend should communicate before June 20th with Capt. H. S. Neville, Room 239, Air Ministry, enclosing two guineas for expenses.

A Volunteer Reserve Air Force.

Sir,—I have read recently with great interest, in THE AEROPLANE, the letter concerning the Voluntary Air Reserve Force, and I, an Englishman of the French Foreign Legion, who has had three years' flying experience as a war pilot, would willingly be a member of the V.R.A.F.

I think, like most sensible persons, that it is of the utmost importance to have a strong Reserve Force, for we must keep in mind this old and very true motto :—

"To preserve Peace, be prepared for War!"

Hoping that many AEROPLANE readers will support the above proposition. R. COLLINS.

In Aid of the Airmen's Relief Fund.

On Wednesday, June 11th, at three p.m. and eight p.m., a musical entertainment will be given in the Working Men's Club, Ingatestone, in aid of the Airmen's Relief Fund. A canteen comedy in two acts, by Miss C. M. Jennings, entitled "Poached Eggs and Pearls," will also be played.

The entertainment is under the distinguished patronage of the Lady Petre, Audry the Lady Petre, Mrs. S. H. Petre, and Miss Agnes Petre, and, among others, Major H. Petre, D.S.O., M.C., R.A.F., and Capt. W. Petre, R.A.F.

Tickets, price (afternoon) 3s. 6d., 2s. 6d., and 1s., (evening) 3s., 2s., and 6d., may be obtained from Mrs. S. H. Petre, Tor Bryan, Ingatestone, and Mr. Percy Greenfield, The Clock House, Ingatestone.

"Contact" and "Klaxon" Again.

The June "Blackwood's Magazine," published a few days since, contains the first instalment of "Eastern Nights and Flights," by "Contact" (Capt. Alan Bott, M.C.).

"Blackwood's" is well known for the high standard of its material, and after the rubbish which—written by those who claim to know something of aeronautics—it has been one's fate to read lately, it is with relief that one turns to such an unfailing writer as "Contact."

Judging merely by the first instalment, "Contact" has lost none of his charm of writing during his period of captivity, and one fell at once under the spell of the writer of "An Airman's Outings."

Among the other writers in this month's "Blackwood's" is "Klaxon," who is giving at some length the extremely interesting story of H.M. submarines.—S. F. B.

Fury at Felixstowe.

The following letter has been received :—

Sir,—Early last year a portion of the Felixstowe Air Station, both material and personnel, was reserved for the purpose of building the "Fury," with a view to flying the Atlantic from Newfoundland *via* the Azores to Europe.

Everything went well, and after the Armistice a large proportion of the men engaged on the project volunteered to remain and finish the boat instead of "demobbing," and a number of those, about thirty in all, agreed to go to Newfoundland and re-erect the machine.

This shows that there was plenty of enthusiasm, as we were working day and night on her to get the "bus" ready for the big trial flight. During the last few months the boat has, as you doubtless know, done wonderfully well and is fit to put a ring round the world and, to quote Col. Porte's own words, "reflects great credit on all concerned."

Since the last long trial a few weeks ago new engines (low compression) have been fitted, and now comes the first instance of red tape in which we are entangled A new mid-ship propeller was necessary. This took about five weeks to order, because the Treasury would not grant the expenditure involved. Even so, they are paying millions per week on tomfoolery in other ways, and I am sure the taxpayers would not begrudge £30 or £40 extra for the honour of making the country's attempt successful.

At the same time, the Navy refused to carry the boat to Newfoundland, as they had no "finger in the pie," notwithstanding the fact that all the officers and men were old R.N.A.S. people. So it was decided to fly from this side. Now for the crowning insult to all of us who stood by to see her finished. The Right Hon. Winston Churchill refuses to sanction the Atlantic flight and makes the miserable excuse that private firms should have the first chance, and this after all the time and money that has been spent in designing and building the most successful seaplane in existence. FURIOUS.

The Dutch Aircraft Exhibition.

A visit of inspection was made by representatives of the Dutch Press to the site of the first aviation exhibition at Amsterdam on May 30th. The party was received by General Snyders, until lately Commander-in-Chief of the Netherlands Forces, Baron Krayenhoff, Flight-Lieut. Plesman, and other officials of the committee.

The exhibition ground lies by the waterside, and is well adapted for the proposed exhibition. Preparations are being made for the accommodation of a large number of exhibits of aeroplanes, seaplanes, and parts, together with everything appertaining to aviation. German and Austrian exhibits, it is stated, will not be accepted.

While the party was being conveyed by boat to the exhibition ground, Lieut. Nieuwenhuis, who had just returned from a remarkably quick flight to and from England, circled overhead, afterwards descending and joining the party.

General Snyders, addressing the company, said it had been felt that Holland must not allow foreign countries to get a start which it could not overtake in this most important branch of human invention and progress.

The exhibition will be held during August.

The Spanish-British Flight.

The Handley Page aeroplane which recently flew from England to Madrid, piloted by Major Darley, R.A.F., left Madrid at 9.30 a.m. on May 29th for England. Unfortunately the machine while attempting to land on the coast near the mouth of the Ardour (north of Biarritz) fell into the sea about 100 yards from the shore. The crew were saved. The aeroplane was carrying some flowers from the King of Spain to Queen Mary, and also an autographed letter from the King and Queen of Spain to King George and Queen Mary.

The Dignity of the Law.

The American Press, which adds so much to the joy of life, has produced the following. One feels that the dignity of the new force is vastly enhanced by these exploits of "Eddie," the "skyrocket" of the "cloud cops," who "praticipated."

The many good points of the article will be noted, but one would have liked more information about the parachute used to demonstrate mail-bag smashing :—

New York's aerial Police Force, co-operating with the shore authorities, made the first airplane "arrest" ever recorded as one of the features of "Aerial Police Day" staged here on the program of the second Pan-American Aeronautical Convention. The "arrest" was but one of the many demonstrations of the practicability of cloud cops as a recognised department of the police force of modern cities.

Fifteen members of the New York air force, who made their first public appearance in their sky blue uniforms, put the program through before representatives of leading cities of the east, making a big hit with their work and incidently giving the Atlantic City Air Port the honour of being the first "headquarters" in action in making an actual arrest.

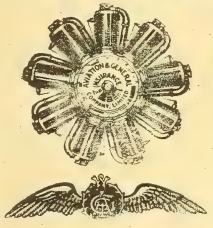
Sheriff Alfred Perkins, of Atlantic County, drove to the aviation field in his automobile and left it parked near the end of the grandstand. While he was chatting with Eddie Stinson, the skyrocket among the aviators here praticipating in the meet, Richard Black, deputy of the Atlantic City Vice Squad, "stole" his automobile and started on a mad dash along the Meadow Boulevard which parallels the airport. The "thief" headed towards Pleasantville, the mainland town at the other end of the meadows five miles away.

Seizing a small Ors parachute, which had been used during the past several days to demonstrate mail bag "smashing" without the necessity of a stop, Sheriff Perkins leaped aboard the Stinson aeroplane. About this time Deputy Chief S. Herbert Mapes, of the cloud force "recognised" Black as a "notorious New York Motor bandit" as the "thief" shot past the grandstand. Captain Horace Keane, of the air division, was circling overhead in Aviator Stehlin's 'plane, and Major Mapes, operating a wireless telephone from "headquarters," shot instructions to him that the man in the automobile was "badly wanted in New York." Capt. Keane wheeled about and set sail for the mainland just as Sheriff Perkins, aboard Stinson's machine left the ground, and they took up the pursuit together.

The speeding aeroplanes beat the motor car to Pleasantville where the Sheriff dropped a message via the parachute to a traffic officer on the Shore Road over which all motor traffic must pass to get anywhere on the mainland. The policeman intercepted the speeding "thief" as he approached the crossing and placed him under arrest.

Capt. Keane descended in a field nearby and lodged a detainer with Sheriff Perkins, who had also alighted, and the two walked over to the "prisoner." County Detective Harry Fulmer "happened along" about that time and the "thief" was turned over to him to bring back to the field. Black, handcuffed to Fulmer, was back in front of the grandstand eleven minutes after he had "stolen" the car and the first official aerial arrest was recorded at airport "headquarters."

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PARIS NOTES

June 2nd.

Roget's 2,200 kms. Non-Stop Flight.

Without detracting anything from the measure of success achieved by Hawker and Grieve in their courageous attempt to fly the Atlantic in one stage, one feels that insufficient attention has been paid to the fine performance put up by Lieut. Roget and Capt. Coli in flying from Paris to Rabat without a stop. This was accomplished on May 24th. The two aviators left Villacoublay at 5.10 a.m., and landed at Kenrifa, about 30 kms. from Rabat, at 4.45 p.m. They were to continue their flight to Dakar, change the motor and then attempt to fly to South America, but in landing the machine was reduced to so much *bois cassée*, so this plan had to be abandoned.

The journey was one of 2,200 kms., thus beating both Read and Hawker's flights for distance covered without landing, whilst the speed averaged 185 kms. per hour, as against 135 k.p.h. by Read. Incidentally they win the prize offered by the paper "Maroc-Sport," although it is worthy of note that Roget had planned this flight quite six weeks before this journal mentioned that they would offer a prize to the first aviator flying from France to Morocco in one day. Unfortunately Capt. Coli, the navigator, is suffering from slight contusions as a result of the accident, although, as is so often the case, the pilot escaped unharmed.

The machine, a Breguet 300 h.p. Renault, was equipped with three petrol tanks, 600 litres in the nacelle and 640 litres in two tanks placed between the wings, this being sufficient for a flight of 15 hours. For all practical purposes the route followed was "as the crow flies," that is to say the aviators passed over Bordeaux, Pyrénées, Madrid, Toledo, Cordova, Gibraltar, and Tangiers.

There are rumours here that Lieut. Roget intends to compete for the "Daily Mail" £10,000, if it has not already been won by the time his new machine is ready; this, I hear, is to be a three-engined machine, but will probably not be ready before the autumn.

A New Height Record.

We have long been accustomed to the fact that as each record is made it becomes increasingly difficult to beat it. Nevertheless, they continue to be made, and we do not yet seem to have reached a maximum as in other forms of sport, such as running, cycling, or horse-racing. In proof of this take the record set up on May 28th at Issy-les-Moulineaux by Lieut. Cazale on a 300 h.p. Hispano-engined Nieuport. This aviator left Issy at 8.55 a.m., and in 41 minutes reached a height of 9,300 metres (30,225 ft.). He landed again at 9.10, making the descent in 29 minutes. The machine is a type No. 29, fitted with à "Lumière" airscrew. Its principal features are:—Length, 6 m. 50; span, 9 m. 70; supporting surface, 27 sq. m.; weight, fully loaded, 950 k.

Lieut. Cazale is a war ace, belonging at one time to N 38 Squadron, with which he brought down 12 Huns.

The performance was witnessed by Lieut. Robin, military commissaire, and by two members of the technical section of the Service d'Aviation.

It is probable that by the time these lines appear in print that Fonck will be the holder of the height record; at any rate he intends to try on a similar machine and from the same aerodrome.

Aerial Cargo Lines.

Many weeks ago I was able to record the first advertisement of the first aerial passenger service. This week I am similarly enabled to record the first publicity of an aerial transport company who have been carrying goods and small packages for some weeks past. The following is a facsimile of an advertisement that appears daily in all the leading papers, and is also to be seen placarded about the town. I understand that the Farman firm are shortly coming out with an extensive publicity campaign, with the object of increasing their number of clients, especially regular ones.

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The Ministry of Public Works has in preparation a project for making a monopoly of aerial transport. One supposes it was too much to hope that this new commercial development of considerable industrial importance should have been allowed to continue as private enterprise pure and simple.

A change that may be of far-reaching effect in the industry in this country is the resignation of M. Robert Esnault-Pelterie from the presidency of the Chambre Syndicale des Constructeurs. M. Louis Bréguet is mentioned as a probable successor.

Probable French Air Ministry.

Mr. Daniel Vincent, of whom mention was made a few weeks back, is determined that France shall have an Air Ministry and its own Under-Secretary of State for Air. In this way he hopes to subordinate the military aviation to the commercial, which is all as it should be, so long as the Boches sign the Peace Treaty and stick to its terms.

Under the Presidentship of M. Lecornu, the "Union pour la Securité en Aeroplane" met last week to decide the details of a new competition designed to make aerial travel at least as safe as that over the sea.

A Mosquito Monoplane.

M. Bossoutrot, the aviator, has been experimenting with a small monoplane called the "Mosquito." This machine which is claimed to be the smallest in the world has a span of four metres (13 ft.). The engine is of 20 h.p. On May 31st it flew for one hour at 1,500 metres (about 5,000 ft.).

Another Book.

Some years ago, during the great war, the world was startled by the news that Lieut. (now Captain) Marchal had flown over Berlin, dropping leaflets on the way, and eventually descended at Cholm, in Poland, 80 miles from the Russian frontier. He has now written a book entitled "After My Flight Over Berlin," in which he describes his journey, capture, treatment, and escape. At the moment he, in company with other famous aces, is stationed at Saint Raphael, from which place he contemplates a flight to Algiers and back in one day.

All the postal services by aeroplanes are working regularly, notwithstanding that accidents happen from time to time. Even the twice a day Nimes-Nice service, which was suspended for a few days owing to the insufficient number of machines, has restarted.

A committee has been formed at Vincennes to affix a marble tablet to the house in which Védrines last lived, commemorating his various echievements.

And Another Aviette.

The prospect of evolving a successful aviette continues to excite considerable interest, not only among the freaks, but also amongst those whose opinions are considered worthy of attention if only on account of their actual "faits accomplis." Thus we find that Captain Didier, of the R.G.A.E., has patented an aviette which weighs less than 30 kilograms. It is a small monoplane of 5 metres span, 2 m. 60 length, fitted with two 3 h.p. motors, each revolving in opposite directions, and, in turn, each actuating a pusher airscrew. The machine is to be known as the "Oiseau Bleu." One hopes soon to record that the oiseau flew!—F. T. N.

SWISS NEWS.

Now that the war is over some of the neutral countries are producing their latest military machines! Thus, from Geneva comes news of a new machine made by the Schweizerische Wagons Fabrik of Schlieren, for the Federal Army. It is a biplane fitted with two machine-guns, one synchronised, firing through the airscrew. The machine has a pronounced dihedral, and the top wings are swept back. They have a span of 11.5 metres, a chord of 1.7 metres, and a fuselage length of 6.80 metres. All the control wires pass inside the fuselage. Ailerons are fixed to the upper planes.

The engine is a type A.S. III. Argus, of 118-180 h.p. constructed by the SeeBacher Maschinenbau A.G. The airscrew has a diameter of 2.75 metres. The landing chassis is fitted with compressed air shock absorbers.

Weight, light, is 740 kgs.; useful load 400 kgs., plus 25 kgs. of water, which gives a total load of 1,165 kgs., or 38 kgs. per square metre of surface, or 6.3 kgs. per h.p.

The first trials were quite successful. She took off in 50 metres, rose to 2,000 metres in 8 minutes, and to 4,000 in 21.

ITALIAN NOTES.

Serjt. D'Urio arrived at Rome one day last week, having flown from Saloniko in 6½ hours. His machine was loaded up with the usual O.H.M.S. post, a thousand military franchise letters, and a document for the Postmaster-General.

A company has been formed for transporting by air fresh fish (which is very abundant and delicate there) from Sardinia to the Capital. Owing to lack of swift transport the islanders only catch enough fish for the immediate needs of their island at present.

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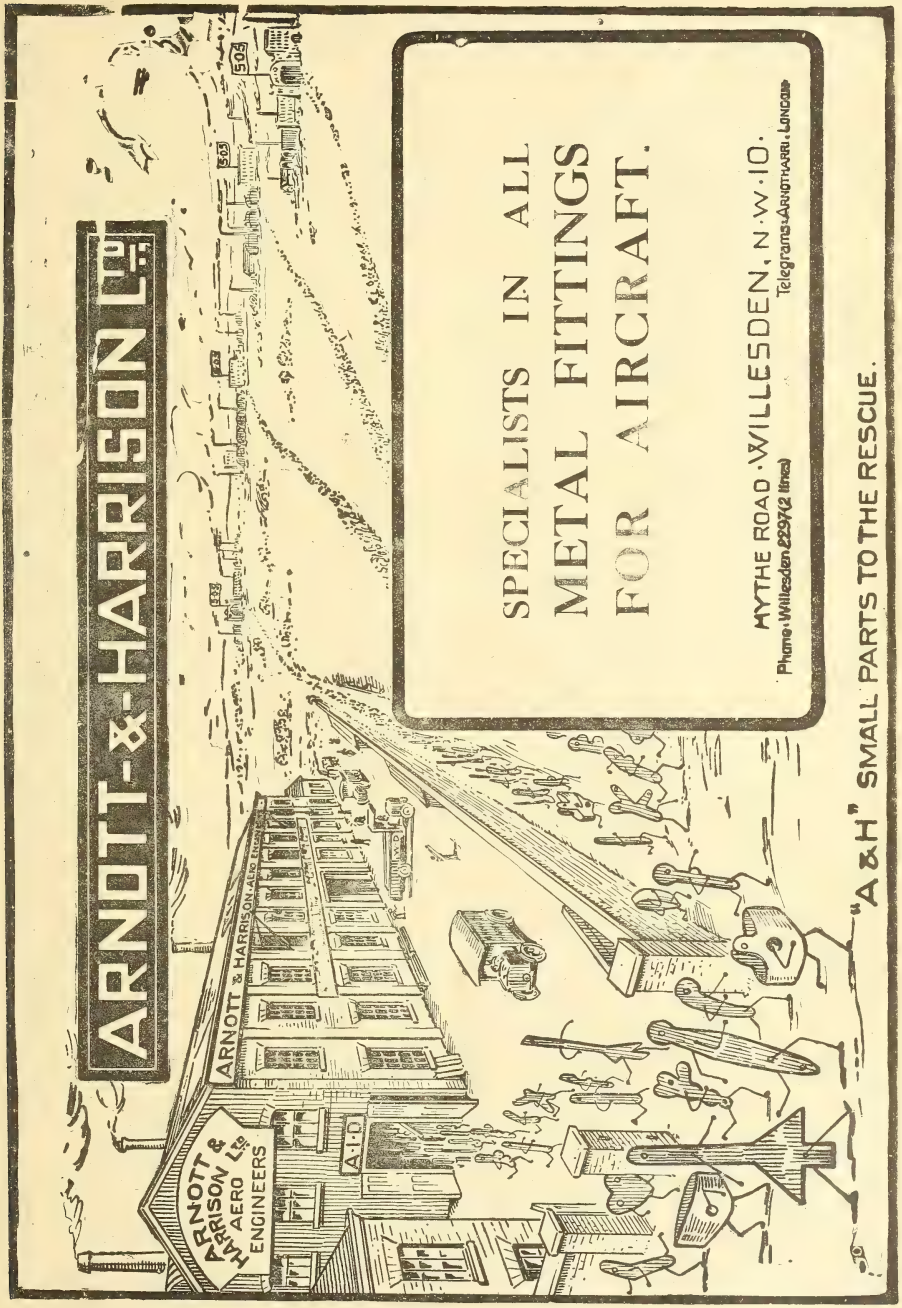
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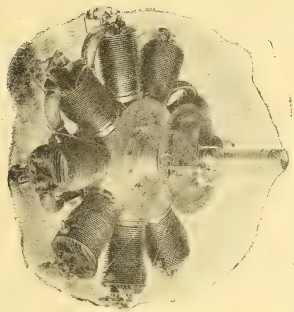
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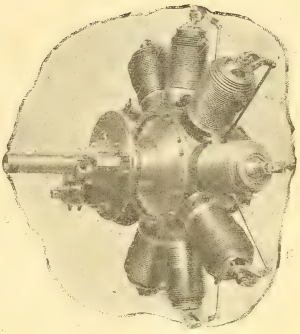
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THE WEEKLY COMMENTARY.

The final instalment of Capt. Sayers' articles on "Commercial Aircraft Design" continues the argument in favour of machines designed for low cruising speeds.

The importance of the development of wing forms which will combine a high lift/drag ratio with a high value of the lift coefficient is insisted upon.

Capt. Sayers' suggestions as to the actual reduction in operating costs which can be obtained by a relatively small reduction in speed are rather startling.

Mr. C. W. Tinson's article on "Longitudinal Stability" is completed in this issue. An actual example of this method is worked out in some detail, and a number of instructive points are brought out.

A number of aeroplanes of various types designed and built by the famous firm of Wm. Beardmore & Co., Ltd., Dalmuir, near Glasgow, are described in the articles on "Modern British Aircraft."

Particularly interesting are the W.B. III and IV ships' scouts.

Only those designers who have actually attempted the design of this class of machine can properly appreciate the difficulties imposed by the requirements of small stowage space on shipboard, and the necessity for some form of emergency alighting and flotation gear for use when a descent on the sea is necessary.

A note will be found in this issue dealing with the possible causes of the accident to the Tarrant triplane.

COMMERCIAL AIRCRAFT DESIGN.—XIV.

SPEED, ITS VALUE AND ITS COST.—(*Concluded.*)

By Capt. W. H. Sayers, late R.A.F.

So far the question has been dealt with on the basis of known wing sections.

A belief has already been expressed that there are very great possibilities of further development in the qualities of the high life type of wing. The author, on the basis of previous experiments, believes that he can at once produce a wing having an L/D ratio of 15 or more at a lift coefficient of 0.7. He has seen test results of wings developed by others who have enjoyed less restricted opportunities for experiment which actually show an L/D of over 20 at this same lift coefficient, with a maximum value of L = 1. If it is assumed that a wing with L/D = 17 at L = 0.7 and a maximum value of L = 1 can be used, then the table of loading per sq. ft., wing h.p. per ton, and landing speed for various economical cruising speeds becomes :—

Cruising Speed.	Loading.	Wing H.P. per ton.	Landing Speed.
20 m.p.h.	1.7 lbs. sq. ft.	7.8	18 m.p.h.
40 ,,	7.0 ,,	15.6	37 ,,
60 ,,	15.0 ,,	23.4	54 ,,
80 ,,	27.5 ,,	31.2	73 ,,

All these landing speeds are high compared to the cruising speed, but it is undoubtedly possible to reduce the landing speed, if by no other means, by some method analogous to the "Fairey" trailing edge flap.

A wing section giving such results brings the 40 m.p.h. machine to within reasonable limits of loading, and hence to a satisfactory structure weight.

Effect of Increased Loading.

It is, however, more directly instructive to consider the effect on the "standard" machine of redesigning it with this hypothetical wing, for a cruising speed of 60 m.p.h. and a loading of 15 lbs. per sq. ft.

This increases the loaded weight to 3,900 lbs.

To obtain the same factor of safety on the same overall dimensions and general arrangement, the structure weight will have to be increased from 930 to 1,600 lbs. The body resistance need not increase in any greater ratio than as the cube root of the loaded weights, roughly as 1.2 to 1. The wing h.p. necessary is still 23.4 per ton, or 41 for this total weight. The body resistance h.p. at 60 m.p.h. becomes 1.2 × 9.6 = 11.52, or a total airscrew h.p. of 53. For the initial climb of 300 ft. per minute and for roughly the same speed margin of 15-18 m.p.h. an additional 35 propeller h.p. is needed—a total of 85 h.p., which at 75 per cent. airscrew efficiency calls for 112 b.h.p.

Taking the same weight per h.p. as on the 1 ton 60 m.p.h. machine, the power plant weight will be 425 lbs.

For a 250-mile journey the fuel needed will become 230 lbs.

Taking pilot at 180 lbs., the total weight without cargo is 1,600 + 425 + 230 + 180 = 2,435 lbs., leaving 1,465 lbs. as paying cargo capacity.

A Great Maximum Range.

It is interesting to note that this machine, carrying 1,700 lbs. of fuel and no cargo, would have a still-air full-speed range of flight of 1,820 miles, and in still air at 60 m.p.h. a range of 2,400 miles, or 40 hours' duration.

Compared with the "standard" machine, the cost of the aeroplane structure would be less than proportional to the structure weight ratio of 1.72 to 1. Probably it would be not more than 1.5 to 1. The engine cost compared to the "standard" would be roughly as the h.p., probably less. This ratio is 112/150 = 0.75.

As the engine cost in the "standard" machine was twice as much as the aeroplane, our last engine will cost 1.5 times as much as the "standard" cost of aeroplane structure alone. Thus the whole of the latter

machine and engine complete costs 3 times as much as the "standard" without engine, or exactly the same as the "standard" complete, or, on the same basis as there taken, £1,200.

Taking again the same machine with the hypothetical high lift wing, and a loading of 7 lbs. per sq. ft., corresponding to cruising speed = 40 m.p.h., one arrives at the following figures.

Total full weight = 1,820 lbs.

Engine h.p. for 40 m.p.h. + climb and speed surplus, 40 b.h.p.

Power plant weight, 180 lbs.

Fuel for 250 miles, 125 lbs.

Structure weight, 780 lbs.

Pilot, 180 lbs.

Total, less cargo, 1,225 lbs.

Cargo capacity, 595 lbs.

Prime cost of aeroplane, roughly equal to "standard," £400.

Engine cost, 40/150 of "standard," £215.

Total machine, £615.

It will be seen that for this size machine 40 m.p.h. is too low a cruising speed, because the structure weight is relatively large.

Collecting all the results into tabular form, one has the figures at the foot of this page.

A Summing Up.

As all these machines are of identical leading dimensions, the cost of shed accommodation is the same. Capital charges and depreciation, maintenance and repairs will be closely proportional to their prime costs.

The relative cost of pilots' wages, taking into account both the time taken over a given journey and the total ton-mileage, is given in the last column, where the cost has been taken as unity for the "standard" machine.

The results which can be obtained with low cruising speeds will improve with increasing dimensions, with shorter distance journeys, and with lowered factors of safety. All these machines are based upon the retention of the original factor of safety of the "standard" machine, which had a minimum factor of 6 for the rear spar and elsewhere and one of 8 for the front spar.

But the figures suffice to show the immense reduction in cost of operation which will become possible if machines are designed to operate at low cruising speeds, more particularly if it is possible to develop wings which will permit good L/D values to be obtained at low speeds in conjunction with very high loadings.

A Case in Point.

In a brochure issued by Messrs. Vickers and reproduced in the Technical Press, the cost of passenger transport from England to the United States by airship is contrasted with that when an aeroplane is employed.

The estimated passenger rate by airship is there given, for London-New York, as £48.

By aeroplane the figure rises to £115.

These figures are based on a schedule speed for the airship of 60 m.p.h., and a maximum of 75 m.p.h., and for the aeroplane of an average speed of 85 m.p.h., whilst in actual flight, with stops totalling 8 hours *en route*.

If their proposed machines were remodelled for a maximum speed = 75 m.p.h. and an economical cruising speed of 60 m.p.h., it would be possible to reduce the total engine h.p. to roughly 75 per cent. of that suggested, which, even carrying the same total weight of fuel, would add at least 50 per cent. to the available capacity for crew and passengers. Leaving the crew at Messrs. Vickers' estimate, the paying load increases from 4,670 lbs. to 7,670 lbs.

The original weight of fuel would permit the maximum distance flown to be increased at least 25 per cent., or from 1,800 to 2,225 miles. This is considerably more than London-Newfoundland non-stop. If the fuel is reduced to that necessary for this stage, a further 1,000 lbs. of paying cargo can be carried. Which is to say that, making no allowances for the reduced cost of lower-powered engines, the estimates of cost per passenger by aeroplane would be reduced in the ratio $\frac{467}{867}$, or roughly halved, by simply taking the same cruising speed for the aeroplane as for the airship.

The fare per passenger then is reduced from £115 to £58, as against £48 for the airship.

The time taken for the whole journey, as against Vickers Ltd.'s figures for the aeroplane, will be increased from 46 hours to 59, which is practically exactly that allowed for the airship.

A General Law.

Generally for all forms of transport it has been found that the total cost of operation increases as the cube of the speed. Aeroplanes are not exempt from some very similar penalty for increased speed.

Under the very appropriate heading of "Fictitious Figures for Flying" or the like, various estimates of the cost of Aerial Transport over 500-mile stages at 100 m.p.h. have appeared in recent issues of The Aeroplane.

These estimates have varied from £1 to £6 per ton-mile, or roughly from 1s. 3d. to 7s. 6d. per passenger-mile. Assuming the V^3 law to hold, as it almost certainly does, at 60 m.p.h. these figures become 3¼d. to 1s. 5½d. per passenger-mile.

Prospects for the Immediate Future.

Thus the prospect of the aeroplane directly competing with present modes of transport is not hopeless.

The prospects, on the contrary, are excellent, upon the sole condition that the designers of commercial aircraft will forget all about the wonderful speed achievements of the war type of aeroplane, and will settle down to design reasonable traffic-carrying appliances.

After all, the successful designer of commercial motor vehicles does not work with the idea of breaking speed records constantly before him. Why should the commercial aircraft designer?

Finis.

Table Showing Effects of Designing for Various Economical Cruising Speeds and Loadings.

Machine.	Cruising Speed.	Loading lbs./sq. ft.	Cargo Capacity.	Fuel for 250 Miles.	Ton Mile Capacity.	Fuel Wt. per Ton Mile.	Prime Cost per Ton Mile of Capacity.	Relative Cost of Pilots Wages per Ton Mile.
"Standard" ..	75 m.p.h.	8 64	400 lbs.	280 lbs.	4.25	66 lbs.	£280	1.00
No. 1. ..	60 m.p.h.	8.64	705 lbs.	150 lbs.	7.8	19 2 lbs.	£102	0.68
No. 2. ..	60 m.p.h.	15.0	1465 lbs.	230 lbs.	16.3	14 1 lbs.	£74	0.34
No. 3. ..	40 m.p.h.	7 0	595 lbs.	125 lbs.	6.6	18.4 lbs.	£94	1 20



Westland Seaplane



D.H. 4 D.H. 9

Westland Weasel



Westland Wagtail

These Illustrations give an idea of the range of our War production, which included machines of Westland design.

Westland Aircraft Works

(Branch of Petters Limited)

Yeovil

The same design staff and organization will deal with Peace enquiries, and our private aerodrome is available for testing.



Short Seaplane
200 HP. Canton



Short Seaplane
225 HP. Sunbeam



Sopwith 1½' Strutter



D.H. 9A



Vickers Vimy

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MODERN BRITISH AEROPLANES

V.—Sir Wm. Beardmore & Co., Ltd.

Before the outbreak of war the famous shipbuilding and engineering firm of Beardmore had arranged to acquire the British rights in the German D.F.W. designs.

After the outbreak of hostilities the firm built large numbers of machines to official specifications, and in addition carried on work on designs of their own.

The technical work of the Aircraft Department at Dalmuir has been throughout under the control of Mr. G. Tighman Richards (late Lieut. R.N.V.R.).

The following descriptions and illustrations give an idea of their original design work during the war:—

THE BEARDMORE BIPLANE W.B. I.

This machine was an early bomber design on sound and normal lines.

SPECIFICATION.

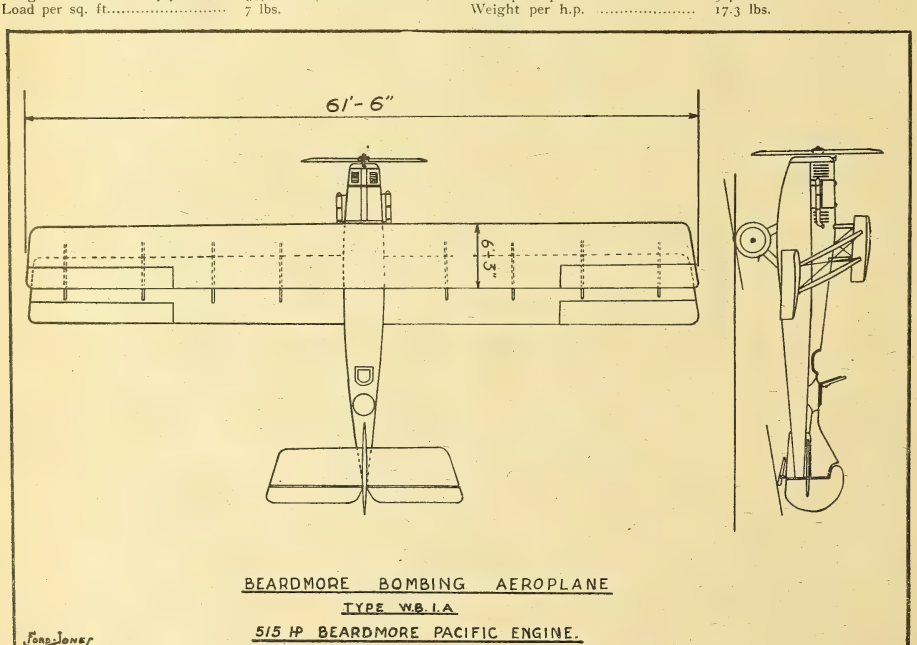
Type of machine	Biplane.
Name or type No. of machine	W.B. 1.
Purpose for which intended	Bomber.
Span	61 ft. 6 ins.
Gap	7 ft.
Overall length	32 ft. 10 ins.
Maximum height	14 ft. 9 ins.
Chord	7 ft.
Total surface of wings, including ailerons	796 sq. ft.
Span of tail	18 ft.
Total area of tail	106 sq. ft.
Area of elevators	40 sq. ft.
Area of rudder	20 sq. ft.
Area of fin	14.2 sq. ft.
Area of ailerons	28.32 sq. ft. each, 113.28 sq. ft. total
Maximum cross section of body	15.2 sq. ft.
Horizontal area of body	88 sq. ft.
Vertical area of body	81.6 sq. ft.
Engine type and h.p.	240 h.p. Sunbeam or 230 h.p. Beardmore "Adriatic."
Airscrew, diam. and revs.	10 ft. 6 ins. dia., 1,075 r.p.m. (with Sunbeam).
Weight of machine empty	3,410 lbs. (with Beardmore).
Load per sq. ft.	7 lbs.
Weight per h.p.	23 lbs.
Tank capacity in hours	7.3 hours.
Tank capacity in gallons	137 gallons.
Performance—	
Speed low down	91 m.p.h.
Landing speed	48 m.p.h.
Climb—	
To 5,000 feet	26 mins.
To 10,000 feet	44 mins.
Disposable load apart from fuel	1,100 lbs.
Total weight of machine loaded	5,600 lbs.

THE BEARDMORE BIPLANE W.B. IA.

An enlarged and more powerful edition of the W.B.1. The general characteristics are obvious from the scale drawings reproduced. A noticeable feature is the very far-aft position of pilot and passenger's seat.

SPECIFICATION.

Type of machine	Biplane.
Name or type No. of machine	W.B. 1a.
Purpose for which intended	Bomber.
Span	70 ft.
Gap	7 ft.
Overall length	32 ft. 10 ins.
Maximum height	15 ft. 8 ins.
Chord	7 ft.
Total surface of wings, including ailerons	946 sq. ft.
Span of tail	19 ft.
Total area of tail	110 sq. ft.
Area of elevators	33.5 sq. ft.
Area of rudder	20 sq. ft.
Area of fin	14.2 sq. ft.
Area of ailerons	29.5 sq. ft. each, 118 sq. ft. total.
Maximum cross section of body	22.5 sq. ft.
Horizontal area of body	105 sq. ft.
Vertical area of body	131 sq. ft.
Engine type and h.p.	Beardmore "Atlantic" 500 h.p.
Airscrew, diam. and revs.	14 ft. dia., 900 r.p.m.
Weight of machine empty	4,537 lbs.
Load per sq. ft.	9.4 lbs.
Weight per h.p.	17.3 lbs.



BEARDMORE BOMBING AEROPLANE
TYPE W.B.I.A
515 HP BEARDMORE PACIFIC ENGINE.

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Prior to the War and throughout the entire War period the Management, Designers and Staff of this Company have been engaged on the Design and Production of aircraft which have been in continual use, day and night, on active service from August, 1914, to the cessation of hostilities.

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Our Organisation which has in the past been responsible for our success in design and production of NAVAL and MILITARY aircraft is now concentrating its energies in the development of Commercial machines. Enquiries are therefore solicited from Governments, Companies, or individuals interested.

Tank capacity in hours	6.5 hours.
Tank capacity in gallons	214 gallons.
Performance—	
Speed low down	110 m.p.h.
Speed at 10,000 feet	101 m.p.h.
Landing speed	65 m.p.h.
Climb—	
To 5,000 feet	12 mins.
To 10,000 feet	27 mins.
Disposable load apart from fuel	2,700 lbs.
Total weight of machine loaded	8,900 lbs.

The Beardmore W.B.II and IIA

These two machines differ mainly in their power plant and performance. Both are small two-seater fighter and reconnaissance machines of high performance, designed upon sound and proved lines.

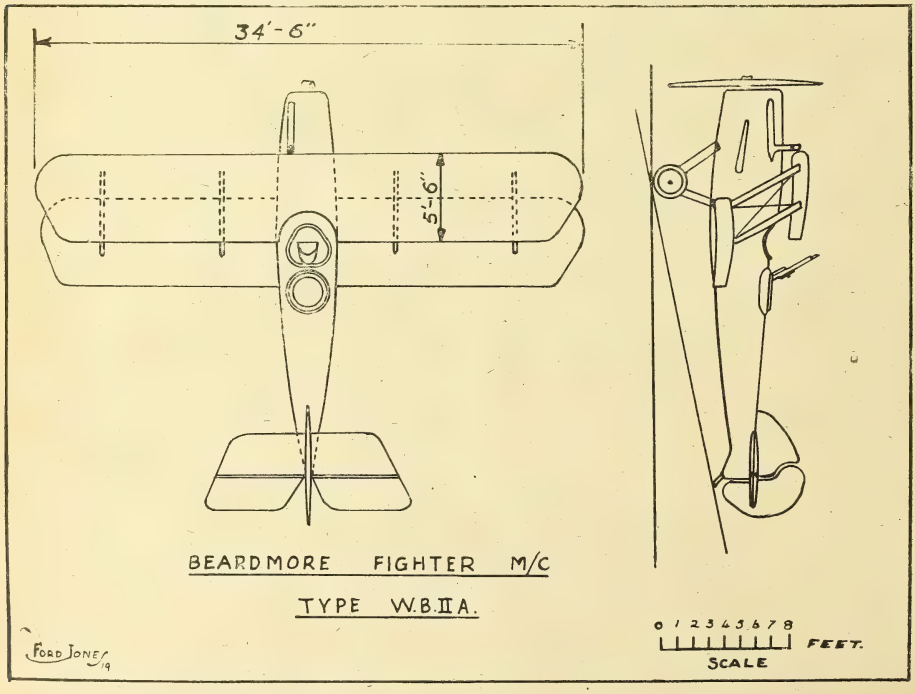
The pilot is sufficiently high to see both over and under the upper plane, and the heavy stagger gives an excellent view downwards over the leading edge of the lower plane.

THE BEARDMORE BIPLANE W.B. II.

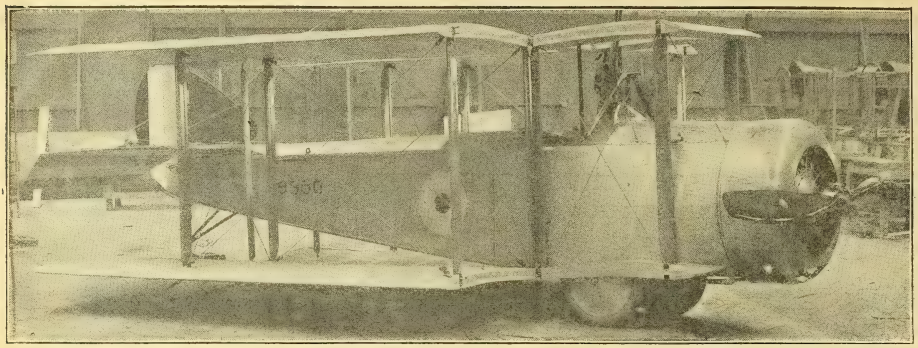
Type of machine	Biplane.
Name or type No. of machine	W.B. II.
Purpose for which intended	Fighter.
Span	34 ft. 10 ins.
Gap	5 ft. 6 ins.
Overall length	27 ft. 3 ins.
Maximum height	10 ft. 11 ins.
Chord	5 ft. 6 ins.
Total surface of wings including ailerons	354 sq. ft.
Span of tail	13 ft.
Total area of tail	49 sq. ft.
Area of elevators	21 sq. ft.
Area of rudder	11.5 sq. ft.
Area of fin	6 sq. ft.
Area of ailerons	16 sq. ft. each, 64 sq. ft. total.
Maximum cross section of body	11 sq. ft.
Horizontal area of body	65 sq. ft.
Vertical area of body	64 sq. ft.
Engine type and h.p.	Hispano-Suiza 200 h.p.
Airscrew, diam. and revs.	9 ft. dia., 1,186 r.p.m.
Weight of machine empty	1,765 lbs.
Load per sq. ft.	7.5 lbs.
Weight per h.p.	13.25 lbs.
Tank capacity in hours	2.8 hours.
Tank capacity in gallons	41.5 gallons.
Performance—	
Speed low down	120 m.p.h.
Speed at 10,000 feet	111 m.p.h.
Landing speed	50 m.p.h.
Climb—	
To 5,000 feet	7 mins.
To 10,000 feet	15 mins.
Disposable load apart from fuel	540 lbs.
Total weight of machine loaded	2,950 lbs.

THE BEARDMORE BIPLANE W.B. II.A.

Type of machine	Biplane.
Name or type No. of machine	W.B. IIa.
Purpose for which intended	Fighter and Reconnaissance.
Span	34 ft. 10 ins.
Gap	5 ft.
Overall length	27 ft. 7 ins.
Maximum height	10 ft. 1 in.
Chord	5 ft. 6 ins.
Total surface of wings, including ailerons	354 sq. ft.
Span of tail	13 ft.
Total area of tail	49 sq. ft.
Area of elevators	21 sq. ft.
Area of rudder	11.5 sq. ft.
Area of fin	8.1 sq. ft.
Area of ailerons	16 sq. ft. each, 64 sq. ft. total.
Maximum cross section of body	11.7 sq. ft.
Horizontal area of body	66 sq. ft.
Vertical area of body	75 sq. ft.
Engine type and h.p.	Beardmore "Adriatic," 230 h.p.
Airscrew, diam. and revs.	10 ft., 1,350 r.p.m.
Weight of machine empty	1,650 lbs.
Load per sq. ft.	7.6 lbs.
Weight per h.p.	11.7 lbs.
Tank capacity in hours	4.5 hours.
Tank capacity in gallons	75 gallons.
Performance—	
Speed low down	125 m.p.h.
Speed at 10,000 feet	117 m.p.h.
Landing speed	50 m.p.h.
Climb—	
To 5,000 feet	5 mins.
To 10,000 feet	12 mins.




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The Beardmore Ship Scout Type W.B.III (80 h.p. Le Rhône Engine) with wings and chassis folded.

Disposable load apart from fuel	460 lbs.
Total weight of machine loaded	2,700 lbs.

THE BEARDMORE BIPLANE W.B. III.

The Beardmore W.B. III. was evolved from the Sopwith "Pup" in an effort to turn this machine into a ship-plane, the principal modifications being folding planes and a retractable under-carriage, in order to simplify stowage on board ship. The fuselage and tail unit are practically of Sopwith design, the overall length being only slightly increased.

Instead of four short centre-section struts, four long struts, two on either side of the fuselage, are fitted with a short horizontal strut connecting them with the upper larger end of the fuselage. The main planes are unstaggered, and hinged at the main rear spar close up to the fuselage.

Two sets of interplane struts are fitted to each set of main planes, one set being placed at the inner edge of the plane in order to preserve the truss when the wings are folded.

Ailerons are fitted to upper and lower planes and are operated on the Nieuport principle, the upper and lower ailerons being inter-connected by a strut.

An ordinary Vee-type under-carriage is fitted, the front members of the vee being hinged, and the rear members equipped with a release device operated from the pilot's seat which allows the under-carriage to collapse into the fuselage, leaving half the wheels exposed. The armament consists of a Lewis gun fitted on a special mounting in front of the pilot's cockpit to allow it to fire through an opening in the centre section.

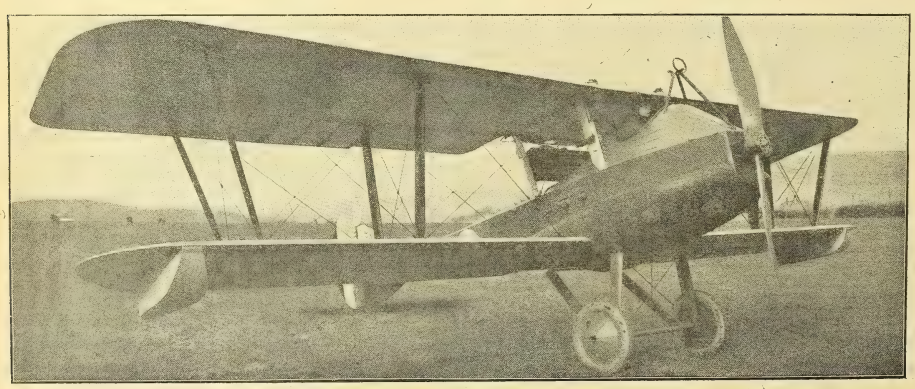
Particulars of this machine are given in the following table:—

SPECIFICATION.

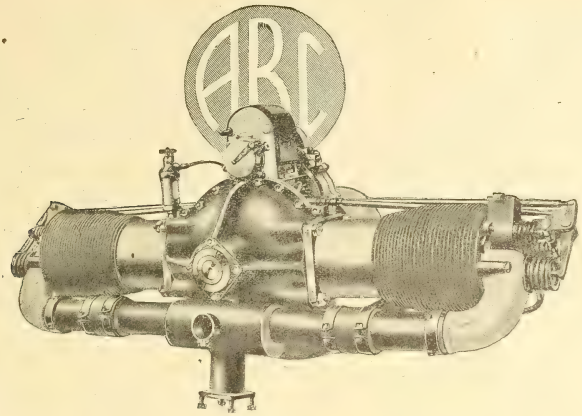
Type of machine	Biplane.
Name or type No. of machine	W.B. III.
Purpose for which intended	Ship's Scout.
Span	25 ft.
Gap	4 ft. 9 ins.
Overall length	20 ft. 2.5 ins.
Maximum height	8 ft. 1.25 ins.
Chord	5 ft. 1.5 ins.
Total surface of wings, including ailerons	243 sq. ft.
Span of tail	10 ft. 1 in.
Total area of tail	34.5 sq. ft.
Area of elevators	11.5 sq. ft.
Area of rudder	4.5 sq. ft.
Area of fin	3.5 sq. ft.
Area of ailerons	5.75 sq. ft. each, 23 sq. ft total.
Maximum cross section of body	4.6 sq. ft.
Horizontal area of body	17 sq. ft.
Vertical area of body	39 sq. ft.
Engine type and h.p.	Clerget or Le Rhône 80 h.p.
Airscrew, diam. and revs.	8 ft. 6 ins.; 1,200 r.p.m.
Weight of machine empty	880 lbs.
Load per sq. ft.	5.3 lbs.
Weight per h.p.	16.1 lbs.
Tank capacity in hours	2.75 hours.
Tank capacity in gallons	18 gallons.
Performance—	
Speed low down	103 m.p.h.
Speed at 10,000 feet	88 m.p.h.
Landing speed	40 m.p.h.
Climb—	
To 5,000 feet	9 mins.
To 10,000 feet	24 mins.
Disposable load apart from fuel	300 lbs.
Total weight of machine loaded	1,290 lbs.

THE BEARDMORE BIPLANE W.B. IV.

The Beardmore W.B.IV is a single-seater ship's scout designed with flotation gear in the fuselage and a dropping undercarriage. In order to keep the size of the flotation gear, which is actually built into the fuselage, down to a minimum, the power unit is



The Beardmore W.B.IV Ship Scout (200 h.p. Hispano-Suiza Engine).



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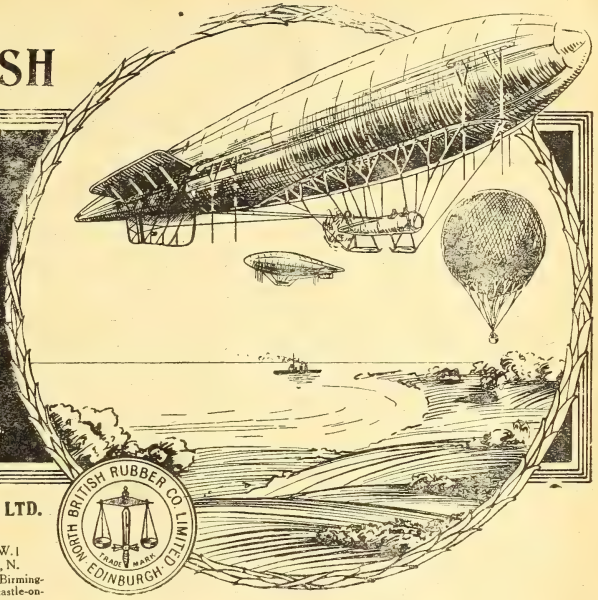
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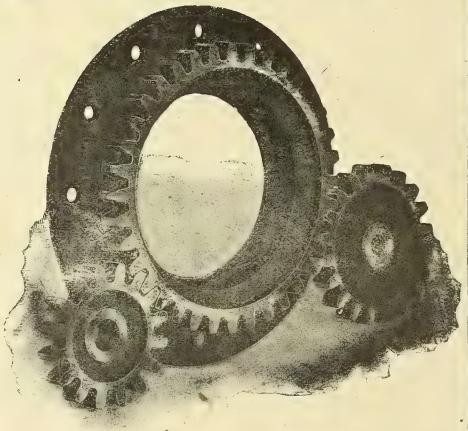
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Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 220.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle - on - Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

British Aerial Transport Co., Ltd. Head Office: 38, Conduit Street, London, W.1. "Batigram Reg. London" Mayfair 637, 638.
Works: Hythe Road, Willesden, London, N.W.10. "Aerbrirans, Phone, London." Willesden, 2272, 2273

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3006.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hampstead 5551.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 4403 and 4424.

Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2604 (2 lines).

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176.

Gosport Aircraft Co., Gosport. "Flight Gosport." Gosport 217.

Grahame-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.
London Office, 12, Regent Street, S.W.1. Regent 2084.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydroplid, Crickle, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St James, London." Regent 912.

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet, "Martinsyde, Weybridge." Woking 331; Byfleet 171.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London." Willesden 2455

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston" Kingston 1088 (8 lines).

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin" Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet." Byfleet 1, 2 & 3.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerlyta, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Airships—

Airships, Ltd., High Street, Merton. Wimbledon 1314.

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 378.

C. G. Spencer and Sons, Ltd. (See under "Balloons").

Aluminium Castings (Sand and Die)

Coan, R. W., 210, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 3846.

Balloons—

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

C. G. Spencer and Sons, Ltd., 50A, Highbury Grove, N.5. "Aeronaut, London." Dalston 1693.

Bent Timber Parts—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Euspuare, London" Museum 406.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Bearings (Etonia Cast Phosphor Bronze)

Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927.

Blowpipes (Oxy-Acetylene)—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic. 3540 (3 lines).

Bolts—

Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16. Dalston 2500 (2 lines).

Books (Aero Engines)—

Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2

Buildings—

Boulton & Paul, Ltd., Rose Lane, Norwich "Aviation, Norwich." Norwich 851

Rubery Owen & Co., Darlaston, South Staffs

Cable Coverings and Cable Controls—

The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green."
Acock's Green 103 & 104

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London."
Willesden 2400 (3 lines).

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4670.

Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricodon, Fen, London." Avenue 34 and 35.

Clothing—

Burberry's, Ltd, Haymarket, S.W.1 Regent 2168.

Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury."
Oldbury 111 (4 lines).

Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, 'Phone, London." Hampstead 4403 & 4404.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Aeros, Richmond."
Richmond 1681.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England "Thompson Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. "And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London."
Regent 4046.

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London" Gerrard 280.

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 440.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries" Dumfries 281-282.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge."
Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham.
Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith."
Hammersmith 1910.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London" Gerrard 8926.

Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1. "Rolhead, London."
Gerrard 1654-5-6.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton."
Wolverhampton 985.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames."
Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1984.

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London."
Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London."
Willesden 2480.

Electric Cables—

E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 24x.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London."
Central 2207; London Wall 1564.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London"
Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Eusroad." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham."
Birmingham 3622 Central (3 lines)

Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61.

Buyers' Guide.



Fluxes—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).
The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.
Voucher, Co., Auto Tool Works, Walsall "Voucher Walsall." Walsall 0196.

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

Glue—
Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Bececolin, Cannon, London." City 1266.
Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid.) "Exeroiden, 'Phone, London." Avenue 4611-2.
Meudine Co., 8, Arthur Street, E.C. Bank 5873.

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340

Heating and Ventilating—
Chas. P. Kinnell and Co., Ltd., 65 & 65a, Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 703.

Instruments—
British Wright Co., Ltd., 23, Chancery Lane, W.C.2. Holborn 1368.

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

Insurance—
Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 6944.
Bray, Gibb & Co., Ltd., 166, Piccadilly, W.1.
S. Sackville & Sons, Duchy Chambers, 4, Clarence Street, Manchester.
Harold Townend, Ltd., 13-14, Abchurch Lane, King William Street, E.C.4. "Carinsur, London." Central 156 (2 lines).
Percy Wingfield, 22, Newgate Street, E.C.1. City 4672.

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London. "Pegamoid, Cent., London." City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—
W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines.)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 430.
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asteroidal, Coventry." Coventry 278.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 999 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—
Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsaero, Phone, London." Regent 1181.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros, Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4933-4934-4935.
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1 "Imbrowned, Bethroad, London." London Wall 6300.
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham." Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115.

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Eusroad, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—
C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London" Central 11305 & 13406.

Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)
C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.
Integral Propeller Co., Ltd., "Aviprop, Hyde, London." Hendon 9. Kingsbury 104
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster instruments, Letchworth." Letchworth 20.

Rawhide Hammers—
Ira Stephens, Whitelands Leather Works, Ashton under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England "Cradock, Wakefield." Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1 "Masticator, Isling, London." City 3811 & 3812.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10 "Rodynalite, Phone, London." Willesden 2480

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830
British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsaero, Phone, London." Regent 1181
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).



The · Aeroplane ·

Accumulators—
The Chloride Electrical Storage Co., Ltd., Clifton Junction, near Manchester. "Chloride, Pendlebury" Central Manchester, 1033 Pendleton, 11.

Acetylene Welding Plant—
Acetylene Corporation of Great Britain Ltd., The, 29, Victoria Street, Westminster, S.W.1 "Flamma, Vic, London." Vic 4840
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1 "Edibrac, 'Phone London." 5340 Victoria (3 lines).

Aeroplane Manufacturers—
Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 220
Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851
British Aerial Transport Co., Ltd. Head Office: 38, Conduit Street, London, W.1 "Balgatran Reg London" Mayfair 657, 658.
Works: Hythe Road, Willesden, London, N.W.10 "Aerbritans, Phone, London." Willesden 3272, 3273
British & Colonial Aeroplane Co., Ltd. "The Bristol Co, Filton, Bristol" Aviation, Bristol" Bristol 3000.
British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2 "Caudroplan, Crickle, London." Hampstead 5551.
Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 2363 and 4424.
Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2764 (2 lines).
Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne" Eastbourne 1176.
Gosport Aircraft Co., Gosport. "Flight Gosport." Gosport 217.
Grahame-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London" Kingsbury 120.
London Office, 12, Regent Street, S.W.1 Regent 2084.
Handley Page, Ltd., 110, Cricklewood Lane, N.W.2 "Hydroplid, Crickle, London." Hampstead 7420.
Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St. James, London" Regent 972.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 382 (4 lines).
Martinsyde, Ltd., Brooklands, Byfleet, "Martinsyde, Weybridge." Woking 331; Byfleet 171.
"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2 "Nieuscout, Crickle, London." Willesden 2455
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford "Dynamo, Bradford" Bradford 3700 (4 lines).
The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodies, London" Putney 2249-2241
Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8556-8331, Manchester
Saunders, S. E., Ltd., East Cowes, I.O.W "Consuta, East Cowes" Cowes 103
Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tastel, Phone, London." Regent 378.
The Siddeley Deasy Motor Car Co., Ltd., Coventry Coventry 954 "Deasy, Coventry."
Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston" Kingston 1058 (3 lines)
The Supermarine Aviation Works, Ltd., Southampton. "Supermarin" Woolston 37 (2 lines)
Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet" Byfleet 1, 2 & 3.
Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerlyta, Knights, London" Kensington 6570.
Waring & Gillow, Ltd., Hammersmith. "Waring, 109, London" Museum 5600.
Westland Aircraft, Yeovil "Aircraft, Yeovil" Yeovil 129.
White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes" Cowes 3.

Airships—
Airships, Ltd., High Street, Merton. Wimbledon 1114.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)
Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tastel, Phone, London." Regent 378
C. G. Spencer and Sons, Ltd. (See under "Balloons")

Aluminium Castings (Sand and Die)
Coan, R. W., 219, Goswell Road, London, E.C.1 "Krankases, Isling, London." City 3846.

Balloons—
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)
C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronaut, London." Dalston 1805

Bent Timber Parts—
Hopton & Sons, George Street, Euston Square, London, N.W.1 "Hoptons, Euspare, London" Museum 496.
Also at Market Harborough, Leicester-hire. "Hoptons, Market Harborough" Market Harborough 15.

Bearings (Etonia Cast Phosphor Bronze)
Brown Bros., Ltd., 61 Eastern St., E.C.1. Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds" Central 5027.

Blowpipes (Oxy-Acetylene)—
Acetylene Corporation of Great Britain, Ltd., The, 29, Victoria Street, Westminster, S.W.1 "Flamma, Vic, London." Vic 4840
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic 5340 (3 lines).

Bolts—
Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16 Dalston 2500 (2 lines).

Books (Aero Engines)—
Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2

Buildings—
Boulton & Paul, Ltd., Rose Lane, Norwich "Aviation, Norwich" Norwich 851
Rubery Owen & Co., Darlaston, South Staffs

Cable Coverings and Cable Controls—
The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green" Acock's Green 103 & 104
Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London"
Willesden 2366 (4 lines).
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—
Holsom, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4078

Casein—
Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3 "Suricolon, Fen, London" Avenue 34 and 35

Clothing—
Burberry's, Ltd., Haymarket, S.W.1
Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh" Edinburgh 3880 Central. (5 lines.)

Component Parts—
Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury."
Oldbury 111 (4 lines)
Brown Bros., Ltd., 61 Eastern St., E.C.1. Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 2363 & 4404.
P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Aeros, Richmond" Richmond 1681
Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England "Thompson Bros, Bilston" Bilston 10

Cords, Tapes, and Threads—
MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow City 3115.

Dopes—
Titanine, Ltd., 175, Piccadilly, W.1 "Tetrafree, Piccy, London" Gerrard 2312
British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellulate, London" Regent 4096
The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London" Gerrard 2870
Cellon, Ltd., 22, Cork Street, London, W.1 "Ajawh, Reg, London." Gerrard 440
Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleoline, Strat, London." East 955

Engines and Parts—
Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1
Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries" Dumfries 281-282.
Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1 "Beardmore, London" Gerrard 238.
The Cosmos Engineering Co., Ltd., Fishponds, Bristol
Dudbridge Iron Works, Ltd. (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London" Vic 7926.
Gordon Watney & Co., Ltd., Weybridge. "Mercedes, Weybridge." Weybridge 550 (7 lines).
Green Engine Co., Ltd., Twickenham Richmond 1203
Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith" Hammersmith 1070.
Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London" Gerrard 8626.
Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1 "Rolhead, London." Gerrard 1634-5-6.
The Siddeley-Deasy Motor Car Co., Ltd., Coventry Coventry 954 "Deasy, Coventry."
Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton" Wolverhampton 085.
The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1 "Eleverfold, London." Walthamstow 811 (2 lines).
Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames" Walton-on-Thames 220

Electrical Accessories—
Belling & Co., Montague Road, Upper Edmonton, N.18 "Belling, Edmonton." Tottenham 1084
Brown Bros., Ltd., 61 Eastern St., E.C.1.
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston road, London." Museum 70.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10 "Rodynalite, 'Phone, London" Willesden 2480.

Electric Cables—
E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 242.
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564

Electric Lighting and Power—
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W. "Installing, Euston road" Museum 70 (4 lines)

Electro Platers and Metal Polishers' Engineers—
W. Canning & Co., 133-137, Great Hampton Street, Birmingham "Materials, Birmingham" Birmingham 3622 Central (3 lines)

Flare Lights—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1 "Edibrac, 'Phone, London" Victoria 5340 (3 lines)

Flexible Shafts—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61



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Fluxes—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London" Victoria 5340 (3 lines).
The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport" Gosport 217.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich "Aviation, Norwich" Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17
Voucher Co., Auto Tool Works, Walsall "Voucher Walsall" Walsall 0196

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham" East 407

Glue—
Cannon, B., & Co., Ltd., Lincoln. London Office, 120, Cannon Street, E.C.4 "Beecolin, Cannon, London" City 1206.
Improved Liquid Glues Co., Ltd., 61 Hermitage Street, E. (Croad.) "Exceroiden, Phone, London" Avenue 3011-2
Meadow Co., 5, Arthur Street, E.C. Bank 587.

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1 "Shatterlys, Piccy, London" Regent 1340

Heating and Ventilating—
Chas. P. Kinnell and Co., Ltd., 65 & 65a, Southwark Street, London, S.E.1. "Kinnell, London" Hop 172 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1 "Hot Water, Friars, London" Hop 703.

Instruments—
British Wright Co., Ltd., 23, Chancery Lane, W.C.2 Holborn 1508.

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180

Insurance—
Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 0934
Bray, Gibb & Co., Ltd., 160, Piccadilly, W.1.
Sackville & Sons, Duchy Chambers, 4, Clarence Street, Manchester.
Harold Townend, Ltd., 13-14, Aberdeen Lane, King William Street, E.C.4. "Carinsur, London." Central 156 (2 lines).
Percy Wingfield, 22, Newgate Street, E.C.1 City 4072

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London "Pegamoid, Cent, London." City 9703 (2 lines).

Lubricating Oil Refiners and Merchants—
W. H. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 264, Tottenham Court Road, W.1. "Vicksmag, Phone, London"
The British Thomson Houston Co., Ltd., Lower Ford Street, Coventry. "Astrolid, Coventry" Coventry 278.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham" Central 109 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Chiford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—
Samuel Mercer & Co., 168, Upper Thames Street, E.C.4 "Reconciled, Cannon, London" City 6342

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury."
Oldbury 111 (4 lines)
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. "Bolts and Nuts" "Bayliss, Wolverhampton" Wolverhampton 1041
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., 61 Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1 "Installing, Euston road, London." Museum 70
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvopult, Phone, London" Holborn 420
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London" Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros, Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros, Hildreth Street, Balham, S.W. Battersea 415
Rubery Owen & Co., Darlaston, South Staffs

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast" Belfast 4053-4934-4035
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1 "Imbrowned, Bethroad, London" London Wall 0300.
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham" Central 703.
MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow. Tapes, Cords, and Threads. City 3115.

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Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries" Dumfries 281-282.
Mann, Egerton & Co., Ltd., 370/381, Euston Road, London, N.W.1. "Manuceur, Euston, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry."
Coventry 530 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing"

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—
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Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3269-3267.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)
C. G. Spencer & Sons, Ltd (See under "Balloons").

Piston Rings—
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2439

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich, "Aviation, Norwich" Norwich 851
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames "Ebora, Kingston" Kingston 672
Integral Propeller Co., Ltd., "Avipro, Hyde, London" Hendon 9. Kingsbury 101
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge" Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 382 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-9
Westland Aircraft, Yeovil "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts "Foster Instruments, Letchworth" Letchworth 29

Rawhide Hammers—
Ira Stephens, Whitchills Leather Works, Ashton-under-Lyne. "Stephens, 704, Ashton" Ashton 704

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England "Cradock, Wakefield" Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Manicanal, Isling, London" City 5511 & 5512
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Safety Belts—
C. H. Holmes & Son, 58, Albert Street, Manchester "Semloh, Manchester" City 2137

Screwing Die Heads—
Voucher Co., Auto Tool Works, Walsall "Voucher Walsall" Walsall 0196

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch "Invictors, Redditch." Redditch 74

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Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds "Propellors, Leeds." Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich "Motors, Norwich" Norwich 382 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford" Bradford 3700 (4 lines).
Short Bros., Rochester "Seaplanes, Rochester" Chatham 627
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton" Woolston 37

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Brown Bros., Ltd., Great Eastern St., E.C.1
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 5340 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10 "Rodynalite, Phone, London" Willesden 2480

Sheet Metal Pressings—
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British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., The, 29, Victoria Street, S.W.1. "Flamma, Vic, London" Vic 4840
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Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 5340 (3 lines).

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Sparking Plugs—

Brown Bros., Ltd., Great Eastern St., E.C.1
Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 255.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 649, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Robinhood Engineering Works, Ltd., Newlands, Putney Vale, S.W.15. Makers of KLG Plugs. "Kaelgec, Phone, London." Putney 2132-3.

Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines)

Steel—

Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield" Central 4522-3-4.

Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Tapes and Smallwares—

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.
C. E. Matthews & Co., Ltd., Castle Works, Bermondsey Square, S.E.1. "Webbance, Berm, London." Hop 4058.

Timber—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London. Museum 496.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Time Recorders—

Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—

Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349.

Turnbuckles—

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Rubery Owen & Co., Darlaston, South Staffs.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston road." Museum 70 (4 lines).

Tyres and Wheels—

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The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Varnishes—

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjap, Phone, London." Mayfair 6347 (3 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Welding and Cutting Plant—

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Wind Shields—

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Greening, N., & Sons, Ltd., 16, Finsbury Street, London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.

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Wirework—

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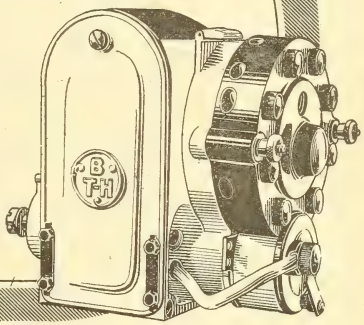
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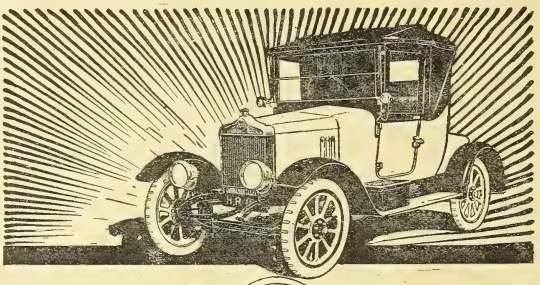
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placed under the centre section and over the centre of gravity, the pilot being seated in front astride the propeller shaft.

The under-carriage is of the Vee-type and is so arranged that by means of a control in the pilot's cockpit the whole chassis can be released.

Two wing-tip floats are fitted as additional stabilisers when the machine is resting on the sea.

SPECIFICATION.

Type of machine	Biplane.
Name or type No. of machine	W.B. IV.
Purpose for which intended	Ship's Scout.
Span	Top 35 ft. 10 ins., bottom 35 ft.
Gap	4 ft. 9 ins.
Overall length	26 ft. 6 ins.
Maximum height	9 ft. 10 5 ins.
Chord	Top 6 ft. 3 ins., bottom 4 ft. 9 ins.
Total surface of wings, including ailerons	350 sq. ft.
Span of tail	11 ft. 9 ins.
Total area of tail	50.5 sq. ft.
Area of elevators	24 sq. ft.
Area of rudder	12 sq. ft.
Area of fin	8 sq. ft.
Area of ailerons	18.8 sq. ft. each, 37 ft. 6 ins. total.
Maximum cross section of body	12.5 sq. ft.
Horizontal area of body	73 sq. ft.
Vertical area of body	51 sq. ft.
Engine type and h.p.	Hispano-Suiza 200 h.p.
Airscrew, diam. and revs.	9 ft., 1,500 r.p.m.
Weight of machine empty	1,900 lbs.
Load per sq. ft.	7.5 lbs.
Weight per h.p.	13 lbs.
Tank capacity in hours	8.5 hours.
Tank capacity in gallons	37 gallons.
Performance—	
Speed low down	110 m.p.h.
Speed at 10,000 feet	102 m.p.h.
Landing speed	45 m.p.h.
Climb—	
To 5,000 feet	7 mins.
To 10,000 feet	18 mins.
Disposable load apart from fuel	340 lbs.
Total weight of machine loaded	2,600 lbs.

(To be continued.)

THE TARRANT ACCIDENT.

The accompanying photograph of the wreck of the Tarrant triplane on Monday, May 26th, at Farnborough, is of some importance, as bearing upon the cause of the accident.

Generally speaking, it has been considered that the opening out of the two upper engines, with a thrust line high above the C.G., caused the machine to turn over upon its nose. If this were the case, the failure of the lower centre section and the consequent displacement of the two chassis must have been caused by one skid digging into the ground.

An examination of the scale drawings of this machine (page 1960, THE AEROPLANE, May 14th) will show that the wheels are very little forward of the probable position of the centre of gravity, and that if the tail rose much above the horizontal the machine would tend to pitch on her nose.

The drawings also show that the internal bracing of the lower centre section is the only bracing holding the two separate chassis in line one with the other, and it seems possible that one chassis hit a bump on the ground and that this lower centre section failed, one chassis swung back, and the machine tripped over it.

This arrangement of two independent chassis held together entirely by the wing bracing has given serious trouble on much smaller machines than this, and it seems quite possible that it may have been the immediate cause of the accident.

At the same time the very great value of both the thrust moments and the inertia moments of the upper pair of engines, coupled with the by no means large elevator area and tail lever arm, added to the rather far back position of the landing wheels, makes the first theory perfectly plausible.

It must be regarded as distinctly unfortunate that so ingenious a form of construction as that developed by Mr. Tarrant should have been tested in a machine so abnormal in every way.

A preliminary test of the Tarrant type of girder, made by redesigning some standard type of machine for the new construction, would have exhibited the structural value of the new methods used without the running the risks attendant upon the trial of so large and so novel a machine.

ALL ABOUT AIRCRAFT REVIEWED.

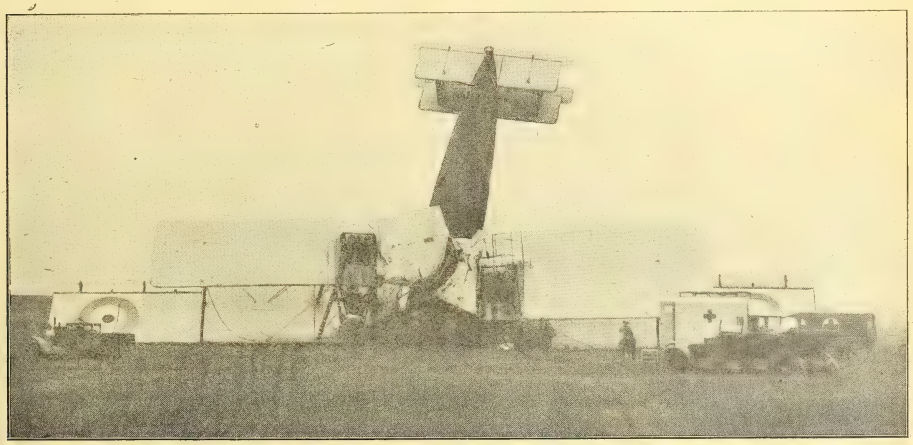
(By C. J. Blackburn and E. J. Newby. Simpkin, Marshall, Hamilton, Kent and Co 3s. 6d. net.)

The chief occupation of all the various people concerned with or interested in aviation would appear to be the making of books thereon. Practically every day a new one is published.

Among the latest books dealing with flying is a little book, "All About Aircraft." Exactly how the authors expect to get "all" about aircraft into 122 pages is not explained; indeed, only heavier-than-air craft are dealt with in the book.

All the best-known types of aeroplanes and aero-engines are illustrated, and a short non-technical description of each is given. Several short chapters on construction, stunting, and fighting, all liberally illustrated, appear in the front of the book, and a glossary of aeronautical terms and a system for the identification of certain aircraft is given at the end.

The book is worth the money to those whose knowledge of aeronautics precludes the possibility of their understanding a technical book.—S. F. B.



The Wreck of the Tarrant Triplane. Note the failure of the Lower Centre Section which has allowed one chassis to move backward.

LONGITUDINAL STABILITY IN PRACTICE.

A Practical Method of Design.

By C. W. TINSON, A.F.R.Ae.S.

(Continued.)

The Gotha twin-engine bombers have a stiffness ratio of only 92½, but from the published accounts of the machine it would seem that a number have been smashed when landing after raids over Britain, and with as low a ratio as this it is most likely that the machine would tend to drop out of the air if a very slow landing were attemped, and a tired pilot would, therefore, either land heavily or attempt to land too fast and damage would result.

The Cody machine in the Military Trials of 1912 had a large elevator in front, but the only tail in the real sense was the little "damper" plane, or horizontal fin, at the end of each rudder boom. The area of both these fins amounted to something like 10 square feet, on which figures the stiffness works out at 59.6.

In such a machine it would be necessary continually to adjust the elevator to maintain balance, the effect of the dampers being merely to reduce to some extent the pressure applied at the control column.

It was said that Cody was the only man who could fly the machine.

The first Wright machines had no tail whatever, and were supposed to be balanced at the position at which the C.P. would be at their flying speed, any displacement due to a gust being corrected by moving the elevator from its no-lift position—the position it was designed to occupy in the ordinary way. Having no tail plane that could be called fixed, there could be no stiffness ratio, which agrees with practice, for flying this machine was analogous to balancing an egg on its point.

The Wright Brothers afterwards rigged a tail plane on booms behind the wings.

One of the first decisions to be made in designing the tail is at what point shall the machine be balanced statically, i.e., where shall the vertical line through the C.G. cut the equivalent plane. This decides the load on the tail. In several of the earlier machines this point occurred fairly far back and a so-called lifting tail was employed.

Recent practice is to balance the machine well forward and to use a tail of symmetrical cross section, and it is well known that such a combination produces a much more stable machine, and if the combination be just right in every particular, a machine can be made to get off and land with no other control but the switch.

While the latter feature cannot come entirely under the designer's control, since the pilot's weight may shift the C.G. sufficiently to make it impossible on all occasions, an examination of the conditions obtaining in the two schemes mentioned will indicate where the C.G. should be to produce the best results.

In a machine balanced at 0.5 of the chord of the equivalent plane, it is clear that the C.P. and C.G. will coincide in a vertical plane at something around the maximum speed, and that at large angles of incidence a strong moment will be brought into play tending to stall the machine.

To overcome this moment the tail would have to be of colossal proportions, for its incidence to the relative wind at top speed would have to be zero, and it would therefore be fixed at +9° incidence at stalling speed—the downwash at top speed being +2° and at stalling speed +7°.

Without going into figures, the size of the tail would obviously be great, and since it would be at +2° to the chord of the wings in order to give no moment at top speed, it follows that at higher speeds it would throw the machine over on its back.

Clearly then 0.5 balance is dangerous and unpractical, even if the tail were large enough to hold up at stalling speed.

The opposite case is when the C.G. in static balance corresponds to the most forward position of the centre of pressure, which in most wing sections is in the neighbourhood of 0.31 of the chord.

If the C.G. be in this position there will be a couple tending to drop the nose of the machine at all speeds except stalling speed, where there will be no moment.

Now the machine should fly "hands off" at its top speed, unless for some special purpose, such as flying for long duration at the speed of minimum fuel consumption, it is required to trim at some speed less than the maximum. The requirement to be satisfied, therefore, is that the tail be of such area and angle that it exerts a moment at top speed equal to the weight of machine multiplied by the distance from C.G. to C.P. when the latter is at the point corresponding to top speed incidence.

Further, the tail plane must raise the nose if the speed increases beyond normal and must raise the tail at lower speeds down to stalling speed to prevent pancaking.

The tail area and angle are inter-dependent, and as the angle at stalling speed is required to be positive and as large as possible, it follows that a very small dihedral will best satisfy the condition at low speeds.

At the same time, there must be a dihedral of definite value or it will be impossible to satisfy the other condition, namely that the nose shall come up at speeds in excess of the normal.

Cutting the dihedral too fine may result in instability at a speed higher than the normal maximum when a condition may exist tending to throw the machine over on its back, and it is believed that this has actually happened in practice, the machine being stiffer upside down than it was the right way up.

It is clear that to fix the dihedral another factor must come in, a consideration unconnected with static balance, but sufficient has been said to show the virtue of balancing at the forward or slow speed end of the C.P. travel.

Arranging the balance at a point ahead of this limit merely imposes more load on the tail plane and is therefore wasteful of weight, unless the dihedral is increased instead of the area and an increase of dihedral makes the righting moment smaller at low speeds.

Since it is impossible to guarantee the position of the C.G. exactly, and a certain amount of tolerance must be allowed, the C.G. should be taken at either 0.29 or 0.34, whichever gives the worst case, in designing the tail. These limits give a little greater latitude aft of the correct position and are suggested for an ordinary land machine or seaplane; for a flying-boat, in which the thrust is high, the greater latitude should be allowed in front of the estimated position, as it is required to include the thrust moment in the weight moment by allowing a sufficient tolerance.

It has been said that a consideration unconnected with static balance must actually decide the amount of dihedral given. This requirement is really of a threefold character. Firstly, the combination of area and angle must be such that the machine flies hands off at the maximum, or some predetermined, speed, and this can be effected with a large area and a small angle, or vice versa.

Secondly, the moment tending to hold the tail up at stalling speed must be as large as possible. Thirdly, there must be a moment at speeds higher than the normal maximum such that the machine, if let alone, will come out of a dive. The consideration governing the combination of area and angle is the loading on the tail plane. It is reasonable to assume that if a similar type of construction is used in the tail to that in the wings, the maximum normal loading on the tail should not exceed that on the wings, but in view of the enormous increase of tail loading when nose diving, it is strongly recommended that tail loading at normal top speed should not exceed 5 lbs. per sq. ft.

By determining the loading, the tail area can be obtained straight away by finding the pressure required on the tail at normal top speed and dividing by this value for normal loading.

The angle to the relative wind can then be obtained by introducing this area into the usual expression for lift, using the v^2 corresponding to normal top speed.

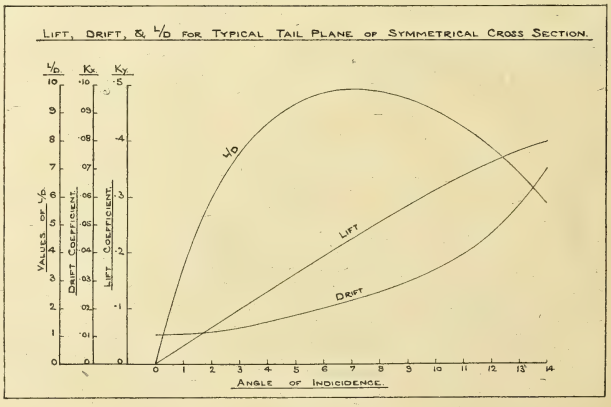


Fig. C.

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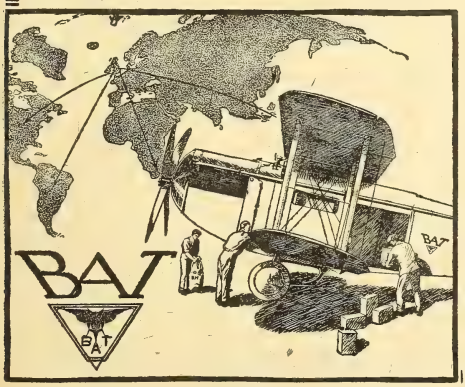
LOAD :—With 600 mile range of fuel —2,000 lbs.

FUEL COST AT FULL LOAD :—7½ pence per mile.

CHASSIS :—A sturdy jib, sprung by an unique combination of oleo and rubber shock absorbers.

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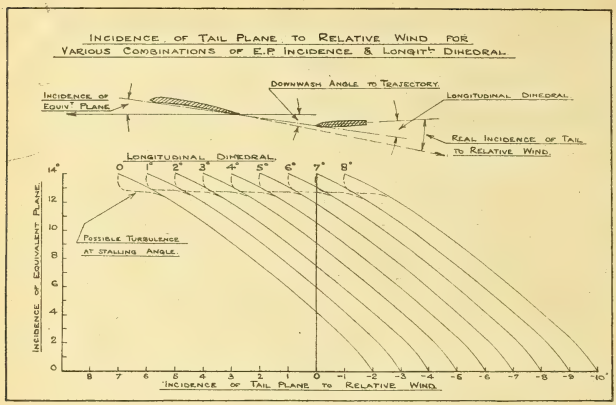


Fig. D.

For example, suppose the tail area and angle are required for a machine of which the following are characteristics :—

W.	Weight of machine	2,875 lbs.
C	Chord of wings	5.5 feet.
V.	Normal maximum speed	97 m.p.h.
	Angle of equivalent plane at speed V	0°.
	C.P. position at speed V	0.5 chord.
	No-lift angle of equivalent plane	−3°.
	Stalling speed	45 m.p.h.
L	Leverage of tail about C.G.	15.75 feet.
	Limiting nose-diving speed	175 m.p.h.
	Distance C.G. to centre of resistance	1.25 feet.

The tail pressure required at normal top speed will be a maximum when the C.G. is at its most forward limit. Taking the range of possible positions of the C.G. as from 0.29 to 0.34 of the chord of the equivalent plane, the tail pressure at top speed is :

$$P = \frac{W\ (.5 - .29)\ C}{L}$$

$$= \frac{2875 \times .21 \times 5.5}{15.75}$$

$$= 211 \text{ lbs.}$$

Specify the loading at top speed as say 6 lbs. per square foot. The area of the tail plane will then be :—

$$A = \frac{P}{\text{Loading.}}$$

$$= \frac{211}{6}$$

$$= 35.2 \text{ sq. ft.}$$

Should the C.G. be behind 0.29, the pressure required will be slightly less than 211 lbs, and the hands off or trimming speed would actually be a little below the normal top speed with the area thus obtained, but it will be found that a fractional decrease in longitudinal dihedral is sufficient to correct this if it is desired to trim at the top speed value.

The area thus fixed, the angle to the relative wind can be found by substituting this value of A in the usual expression for lift, using the v^2 corresponding to top speed V.

Thus in the example :—

$$Ky = \frac{P}{P/\rho\ A\ v^2}$$

$$= \frac{211}{.00237 \times 35.2 \times 20300}$$

$$= .125$$

whence the angle, on the assumption that the tail is similar to T.P.4 is found from the curve of Ky values to be 3.8°. The longitudinal dihedral is found by substracting the downwash angle at top speed incidence of the equivalent plane from the angle of the tail to the relative wind, and adding the incidence of the equivalent plane if any.

On reference to the curve (Fig. D) the downwash angle will be found to be 2° in this case and therefore

$$\text{Dihedral} = 3.8° - 2° + 0$$
$$= 1.8°$$

Having settled the combination of area and angle for trimming at top speed, the condition of stability and loading on the tail in a nose-dive at limiting speed should be examined, for if the loading is too high under these conditions a lower value will have to be substituted and new values obtained for area and angle.

In a nose-dive at limiting speed the assumption is that the planes are at their angle of no lift, consequently the upsetting couple is not due to lift and weight, but to weight and head resistance, which will be tending to turn the machine on its back if the centre of head resistance comes below the C.G.

In the usual type of aeroplane, this couple will be found to assist the tail moment, but assuming that it were not so in the example and that the weight of the machine had a leverage of 1.25 feet, the weight moment would be :—

$$2875 \times 1.25$$
$$= 3592 \text{ foot lbs.}$$

This moment must be overcome by the tail which will be running at an angle equal to the no-lift angle of the wings plus the dihedral, assuming that there is no downwash when the wings are not lifting, which seems reasonable.

If the angle of no-lift be −3° in the machine under examination, and the dihedral corresponding to 35.2 square feet of tail is 1.8° the tail will be running at −4.8° at 175 m.p.h. giving a righting moment of :—

$$P/\rho\ Ky\ (-^{4.8°})\ A\ v^2\ L$$
$$= .00237 \times .155 \times 35.2 \times 256.8^2 \times 15.75$$
$$= 13400 \text{ foot lbs.}$$

This is greatly in excess of the weight moment and if the loading in this condition is not excessive, the tail can be said to be satisfactory in diving.

The loading will now be :—

$$\frac{13400}{35.2 \times 15.75}$$
$$= 24.16 \text{ lbs. per sq. foot.}$$

or 4.025 times the normal loading.

If the tail be designed for the usual factor of safety of 6, there would be a little in hand, but not nearly enough to satisfy the usual requirement of 2.5 factor of safety in diving asked for on wing structure.

It is true that, in practice, the elevators would have to be used to produce and maintain the attitude assumed and because their inclination practically converts the tail into a cambered surface, much of the top pressure disappears, and is limited, if it exists at all, to the nose of the tail plane and leading edge number.

However, if the controls are suddenly let go and the tail has to pull the machine out of the dive by itself, the case taken is rational, especially in a seaplane where the centre of resistance is brought down by the floats in a dive. **(Fig. E).**

In a land machine of the ordinary type the weight moment very often assists the tail in restoring equilibrium, but the fact cannot be got away from that under conditions that are temporarily possible, the loading on the tail may reach a very much higher value than its normal, by virtue of the fact that it is being forced through the air at a certain negative incidence at a very high speed, and that, unlike the main planes, it cannot adapt its angle to the speed but is bound to follow the planes at the altitude governed by the incidence and the fixed longitudinal dihedral.

Further to emphasise the importance of this point in tail design, suppose that for some reason the machine is out of balance on its first flight and the dihedral is increased by 1½° to make the machine trim.

In diving, the tail will now be at -6.3° and the loading, instead of being 24.16 will increase to 31.62 lbs. per square feet, or 5.27 times its normal.

If the tail be designed for a factor of 6 it will be very near collapsing.

To provide against such a possibility the range over which the C.G. is allowed to occur should be ample, which in conjunction with the method of finding the characteristics of the tail outlined in these notes will give such an area that the adjustments to the angle which may be necessary after the first flight will be so small that overloading need not be seriously considered.

The next case to receive consideration is the state of affairs existing when the tail is at its position of zero incidence to the relative wind and is therefore giving no moment at all.

For the worst case in this instance, the C.G. should be taken at its rearmost limit, say 0.34 of the chord, for if the angle of the main planes corresponding to no-lift of the tail is such that the C.P. is ahead of 0.34 there will be a risk of the tail dropping when climbing.

Reference to the curve of Real Incidence of the tail shows th

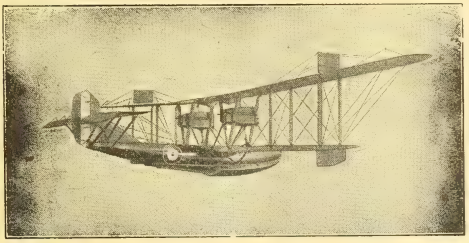


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the no-lift position for a tail set at 1.8° dihedral occurs when the main planes are at + 7.3° incidence, at which angle the C.P. in an average wing section would be at approximately 0 35 of the chord.

This is behind the rearmost limit of the C.G. and so the nose will be dropping, which is what is wanted.

Finally there should be an overplus of righting moment at stalling speed to prevent the tail "sitting down" when landing slowly, and to avoid sudden loss of speed with the subsequent pancake.

Here again the worst case for the tail will be if the C.G. is back at its most rearward limit, for if it were at 0.29 or even at 0.31 there would be no weight moment of any consequence owing to the C.P. and C.G. practically coinciding.

At stalling speed, if the C.P. is at 0.31 of the chord, the maximum possible stalling moment in the example is :—

$$\begin{aligned} & W\ (.34 - .31)\ C \\ &= 2875 \times .03 \times 5.5 \\ &= 474.5 \text{ foot lbs.} \end{aligned}$$

Referring to the table of Incidence of Tail Plane to Relative Wind, a 1.8° dihedral gives -5.1° incidence at stalling speed, i.e., 14° incidence of planes.

The speed being 45 m.p.h. there will be a righting moment of :

$$\begin{aligned} & .00237 \times .165 \times 35.2 \times 4350 \times 15.75 \\ &= 943 \text{ foot lbs.} \end{aligned}$$

This shows a good margin of righting moment.

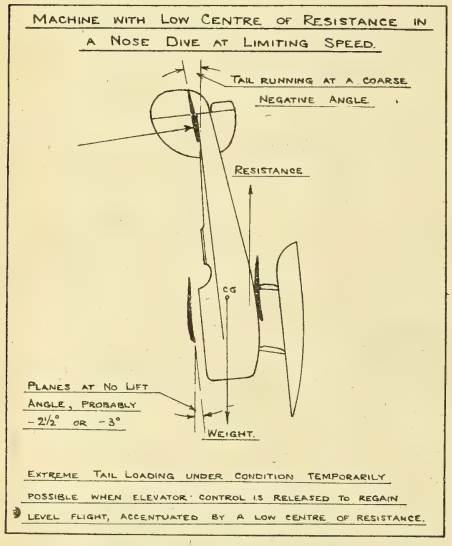


Fig. E.

The amount by which the righting couple should exceed the weight moment at stalling speed is a question connected with "stiffness," and if the relative stiffness worked out by the method used in obtaining the values tabulated earlier in these notes is something over the value indicated as an average, namely 300, the tail calculated in the example can be adopted.

$$\begin{aligned} \text{Modulus of Stiffness } S &= \frac{A\ L\ V^2}{W\ C} \\ &= \frac{35.2 \times 15.75 \times 97^2}{2875 \times 5.5} \\ &= 330 \end{aligned}$$

This value compares favourably with machines known to be nice to handle, but raising it would lighten the loading on the tail in a dive, the only doubtful quantity in the example worked out.

Regarding the adjustment of the tail in flight to trim the machine at speeds other than top speed, the least dihedral will be given by the top speed angle worked out on the assumption that the C.G. is at 0.29 of the chord.

If the C.G. be behind 0.29 as it should be if weight estimates are correct, there will be a little in hand to prevent the machine going downhill with hands off.

The bottom limit will probably be such that the machine can be flown hands off at about half throttle.

In the example, let the machine be trimmed to fly hands off at 55 m.p.h., at which the incidence of the planes is, say 8°.

The C.G. should be taken at 0.29 so that the pressure required on the tail works out at its highest probable value. There should then be a little to spare when flying hands off at this speed which will ensure the range of adjustment given being adequate.

The C.P. at 8° will be at 0 342 of the chord, and if the C.G. is at 0.29 the pressure on the tail required will be :—

$$\begin{aligned} P &= \frac{W\ (.342 - .29)\ C}{L} \\ &= \frac{2875 \times .052 \times 5.5}{15.75} \\ &= 52.3 \text{ lbs. (downward).} \end{aligned}$$

The angle of the tail to the relative wind for this pressure works out at —2.65°.

Referring to the curve, —2.65° actual tail incidence and 8° incidence of the equivalent plane gives a dihedral of 5°.

The adjustment provided therefore should be from 1.8° dihedral to 5° or 5.5° dihedral to cover all possible requirements.

With regard to the top speed limit to the tail adjustment, it is believed that in some cases this has been fixed to allow the machine to exceed its normal top speed with hands off the controls, with the object of diving with both hands free, but while this might have been necessary in war, there is nothing to be gained by it in the ordinary way, for the decrease in total resistance will not be great.

Beyond a certain point it might be necessary to wind the tail back to get out of the dive, the elevators being overpowered and it would therefore appear that the high speed end of the limit to the adjustment should correspond with the angle found in conjunction with 0.29 balance.

In conclusion, it is hoped that this method of dealing with the design of the tail plane by "worst cases" and of solving for its area by the loading method may be of some assistance, and tend to simplify the problem and cut short the time that would otherwise be spent in calculations of an exceedingly intricate nature.

NEW ITALIAN MACHINES.

At the last general meeting of the Macchi-Nieuport firm it was stated that nearly every concern building aircraft here had contracts on hand for turning out Macchi seaplanes at the time of Austria's collapse.

The Fiat-Sia Atlantic attempt preparations are well ahead, and the machine is ready for its trials. It is hoped to carry 2,500 kilos. of petrol and to attain a speed of 250 kms. per hour. The type is the Br., and the engine is a Fiat A.14, specially tuned.

It seems only too true that three Liberty engines are being fitted to the C.A. 1,200 h.p. triplane built here. By-the-bye, one of these big machines which carries twenty passengers comfortably will very probably be touring to England shortly. There was talk of one of the tiny 300 Fiat-engined C.A. triplanes making a non-stop voyage from Turin to London with two pilots only on board.

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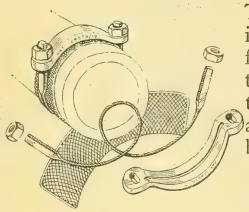
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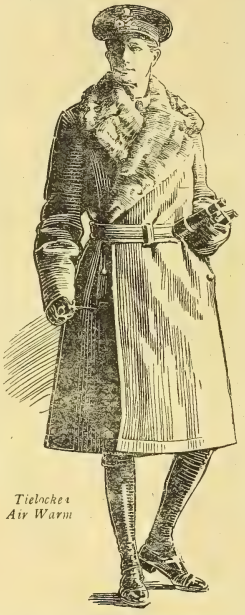
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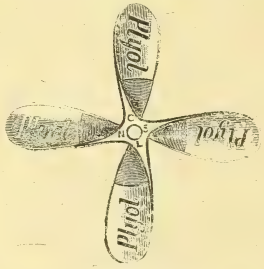
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THE AIRCRAFT TRADER

MARKET TOPICS.

Prices are for Quantities on Usual Terms.

May 29th, 1919.

COPPER.—The recent activity in this market does not indicate that consumers are at last showing a healthy interest in the metal, but it looks as though stockholders were behind the movement; the quantities purchased by actual consumers are only small, and they are apparently still buying hand-to-mouth. The production still exceeds the demand, and large stocks must be held in various parts of the world, and it is stated that immediately Peace is signed offers of Copper will be very freely made, particularly to the Central Powers.

Some of the estimates of the demand which is likely to come from the latter have certainly been exaggerated; on the other hand, there is bound to be a fair demand from them; this feature of the market is influencing American sentiment, and the general impression is that the revival of industry is not far away. There is at present no selling pressure, as there is a strong feeling in U.S.A. that values will harden when consumers begin to show activity.

Comparative Prices.

	Per Ton.
To-day May 28th	£79 5 0
Last week	79 7 0
Last year	110 5 0
Lowest Price, 1918	100 0 0

TIN.—There has been a reaction in this market since Tuesday last, and prices have declined from £247 to £233 on Friday. The position is very uncertain, and the market continues very sensitive. There is, in fact, no sign of stability; the demand is very spasmodic, and consumers are still in a waiting attitude. The position in America is unchanged, and the market continues in a state of stagnation.

The outlook is very uncertain, but it is not expected that there will be any serious decline in price. At the same time the present price, although not unreasonably high, cannot be considered low.

Comparative Prices.

	Per Ton.
To-day, May 28th	£236 6 0
Last week	245 7 0
Last month	226 12 6
Average price, 1918	329 10 0

LEAD.—The activity which was being witnessed amongst consumers received a sudden check last week, when the Government announced a reduction in the price of their Lead of 20s. per ton. The first effect of this announcement was to scare buyers, and they have not yet fully recovered, so the business done during the past week has been very small. It is understood that large stocks are available, the stock in Australia being approximately 80,000 tons. In sympathy with the reduction in the price of Pig Lead, the prices of Lead Pipes and Sheets have been reduced 20s. per ton. Sellers were offering Lead on Monday at £23 5s.

STEEL.—This market continues very unsatisfactory, the general opinion is that the prices quoted at present are too high and must decline. On the other hand, manufacturers state that this is impossible, and although there is a fair demand for certain classes of Steel, the majority of buyers are living hand-to-mouth and are awaiting developments. The position is so uncertain that few firms will quote for delivery after June unless all kinds of price reservations are made. American firms are still busy, and it is stated that they have recently taken some large orders from India, the approximate total being about 10,000 tons. It is understood that British makers lost the order owing to the prices being high.

There has been a substantial reduction in the prices of Swedish Iron Ore, and there should now be a further reduction in the prices of Crucible Cast Steels.

TIMBER.—The Timber market is at the present time very firm, if anything, there is an upward tendency. This is particularly noticeable in the Hardwood market. The keenness shown by buyers at the recent sales is particularly healthy, and this market is becoming stabilised. The demand is active, and prices which are fairly reasonable continue firm.

At one recent sale a quantity of Mahogany of Aeroplane quality did not attract any buyers, prices being too high. The Timber had apparently been bought on a high market. The demand for all classes of Timber for Aeroplane construction continues dull, and there are at present no signs of a revival; in fact, everything indicates it will be some considerable time before there is any activity possible by buyers of Aeroplane Timber.

Aeroplane constructors who suffered dislocation of output due to inferior Silver Spruce substitutes will be interested in the questions which have been asked recently by Mr. Remer, who is a well-known timber merchant. The following questions were asked last week-end by this gentleman. Questions and answers are given below:—

In the House of Commons during the week-end Mr. Remer asked the Secretary of State for War how many machines, manufactured and partly manufactured, had to be discarded owing to cypress being found an unsuitable wood for use on aeroplanes?

Major-General Seely: No machines had to be discarded for this reason, but the substitution of other woods involved the supply of about 900 main planes, 100 main spars and 55 tail planes for machines on charge of the Royal Air Force. Substitutions were also required for machines in the hands of contractors, and particulars of these are being sought for in accordance with the undertaking given to my hon. Friend in answer to his previous question on this subject.

Mr. Remer asked the Secretary of State for War if he will give the names of his present advisers as to the most suitable woods necessary for use on aeroplanes; what were their pre-war occupations; and what practical experience of sawing and manufacturing Timber they possess?

Major-General Seely: The Timber Committee of the Conjoint Board of Scientific Societies, in connection with the Royal Society, advises on the suitability of Timber for Aeroplanes. I will send my hon. Friend a list of their names.

ACCUMULATOR RATINGS.

Some ten years ago the Committee of the Accessories and Components Section of the Society of Motor Manufacturers and Traders issued some rules for accumulator rating, which were reviewed and revised in 1918, and the Society have accordingly issued an explanatory article by Mr. Wm. Peto on this subject, from which the following has been extracted:—

When accumulators first came into use for the purpose of supplying current for sparking plugs, in conjunction with an induction coil, they were mostly imported from France, where a practice existed of marking the capacity at a value double that which could actually be obtained if they were discharged continuously. This practice was copied by British manufacturers, as the distributing trade had become accustomed to these values.

The current actually taken by an induction coil is not only intermittent, but it is impossible to state what amount is taken, and it is impossible to gauge the value of these excessive claims for output or capacity under ignition conditions.

When accumulators began to be used for the purpose of supplying current to lamps taking definite quantities of current continuously, it became important. Accumulators sold as having a capacity of 60 ampere hours for ignition work would probably give 30 ampere hours if discharged at 3 amperes for 10 hours, lighting, for example, two side lamps and tail lamp.

The buyer, however, would be under the impression that 60 ampere hours could be obtained, equivalent to 3 amperes for 20 hours. The chief point considered was as follows:—

No value for the capacity of an accumulator is of practical use unless it is stated at what rate current is assumed to be taken from the cells. For example, an accumulator of 30 ampere hours would give this output if discharged at 3 amperes for 10 hours, but if discharged at 30 amperes for one hour, only 50 per cent. of the normal output would be obtained, namely, 15 ampere hours.

As motor-car cells are discharged at moderate rates with frequent intervals of rest, the Society of Motor Manufacturers and Traders standard rate of discharge was taken as being 20 hours, with an interval of rest or time for recovery half-way through the discharge.

The rule for accumulator rating is therefore as follows:—Accumulators shall have printed on their labels their actual capacity when discharged continuously at one-twentieth of the capacity claimed. An interval of rest to be allowed, such interval not to take place until half the period of discharge has expired.

During the past year this important subject of accumulator capacity has also been fully considered by the Portable Battery Makers' Section of the British Electrical and Allied Manufacturers' Association.

Their standard capacity curve has been considered by the Accessories and Components Committee of the Society of Motor Manufacturers and Traders, who have agreed that figures for capacity based upon the 20 hour figures in this B.E.A.M.A. curve are acceptable as true values for capacity at 20 hour rate.



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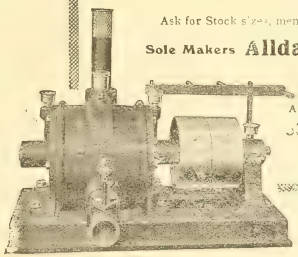
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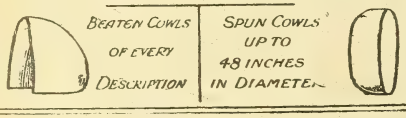
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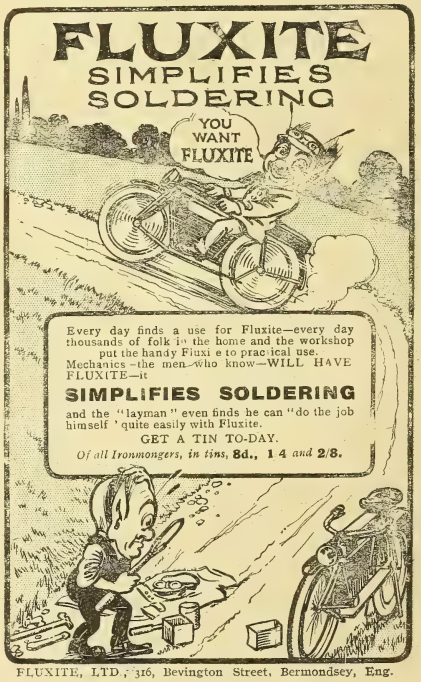
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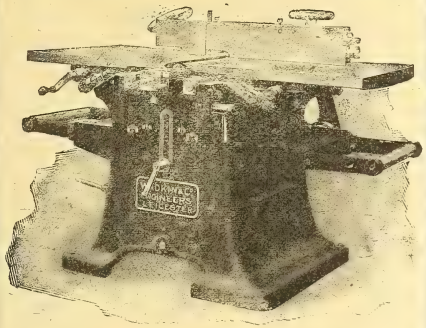
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FIRST COSTS AND RUNNING COSTS.

By "MEDWAY."

I take the following quotation from a recent issue of an evening paper:—

"The Aero Club of America announces that Capt. d'Annunzio, aeronautical engineer, son of the famous Italian poet-aviator, is engaged in manufacturing aeroplanes with a wing spread of less than 20 feet, and thus capable of landing in streets. It is to sell for £240.

"Capt. d'Annunzio has been in the United States more than a year, in charge of construction of Caproni aeroplanes for the United States Army. The new machines which he has designed are guaranteed to fly two and a half hours. It is announced that members of the Aero Club have placed orders for several of these new machines."

I take it that the journalist and not the engineer is responsible for the last sentence but one. No doubt it is intended to mean that the machine will keep the air for 2½ hours. At the same time it *does* mean that 2½ hours is to be the life of the machine.

Useful Deductions.

From a trivial mistake of this kind some serious and perhaps useful deductions may be drawn. It leads one to a line of thought that is not uninstructive. Do we want very cheap aeroplanes to be produced at present, particularly if, in order to secure cheapness, we must sacrifice some degree of durability? In other words, is cheapness in first cost a factor which can exert sufficient influence to make it worth our while to give it much attention until we have got several stages nearer perfection?

Let us take a few rough figures. Assuming that we started services with machines costing four thousand pounds each, and having an average life of three thousand hours in the air, the depreciation in the value of the machine during each flying hour will then be £1 6s. 8d. Suppose that the average speed is a little over a hundred miles an hour. Then we have to depreciate at the rate of 320d. for every journey of a little over a hundred miles. This works out at about 3d. a mile.

Now I take it that most people will agree with me that it is not at all likely to pay to run such a machine unless the receipts can be estimated at 7s. or 8s. a mile. If we take the latter figure, then our depreciation allowance is only just about 3 per cent. of the total receipts on which we have to reckon.

Supposing we manage to halve the cost of the machine without in any way reducing its durability or efficiency, we should be able to work at a profit on receipts about 1½d. a mile lower. Even in this extreme case we are aiming at something which is hardly worth attempting.

Durability and Efficiency.

Moreover, it is more than questionable whether the halving of the first cost would not inevitably affect durability or efficiency. With petrol at half-a-crown a gallon, a difference in consumption of 1½ gallons for every 30 miles would neutralise the whole of the savings under the heading of depreciation, assuming the cheaper machine, of course, to be less economical.

If by halving the first cost we also halved the durability, we should gain nothing whatever, even under the heading of depreciation, and we should probably lose under all other headings.

It is quite wrong to regard first cost as a lump sum. It should really be reckoned always simply and solely as cost of depreciation, to which, if we wish to be very accurate, we must add an allowance corresponding to a reasonable rate of interest upon the money expended. When we have entered both these items, the figures of first cost, as such, need no longer be considered.

The First Cost of Machines.

In point of fact, the first cost of machines used would represent only a very small fraction of the total expenditure necessary in order to finance a service and to provide the ground organisation needed in connection with it. I take it that nobody would at present suggest economising in the ground organisation. We all agree that we must have the best possible devices to assist navigation and to enable the pilot to overcome difficulties and dangers occasioned by fog and by unreliable weather.

The organisation for repair and maintenance must be as perfect as possible, otherwise we shall suffer delays which will bring the service into disrepute.

Our first duty is to prove reliability and safety. When that has been done conclusively, we can get down to the process of fractional monetary savings. Until we have proved our case on the main issues, it would be folly to do so.

I do not mean that we should make no attempt whatever to eliminate unnecessary expenditure in the manufacture of machines. We have to formulate a commercial proposition, and we must certainly do so on commercial lines, which are not consistent with deliberate waste.

My point is rather that, if I were advising on the establishment of a service, I should certainly recommend that there should be no attempt to economise in the cost of any portion of the machines themselves if the makers are of opinion that economy can only be obtained at the cost of some sacrifice of durability or efficiency.

Undesirability of Standardisation.

I wrote the other day on the subject of the undesirability of attempting to standardise for some years to come. The whole argument in favour of standardisation is that, if achieved, it would result in certain economies. The difficulty in tackling any broad subject of this kind is that it is almost impossible to emphasise a principle without appearing to go to an extreme. Standardisation and the lowering of first cost are both admirable objects, provided that they are not carried to excess. My argument is that we are in much more danger of going too far in such matters than of failing to realise their importance.

On the question of first cost, let us take a rough analogy from the motor-'bus. The life of such a vehicle should certainly not be less than a hundred thousand miles. It ought to be considerably more, but we will take this figure. Suppose that the 'bus costs a thousand

pounds, we have to allow for depreciation at the rate of £1 for a hundred miles, or about 2½d. a mile. Suppose we reduce the cost to £750, we reduce the depreciation allowance by about a quarter, or not much more than ½d. a mile. The total cost of operation may be somewhere in the neighbourhood of 1s. a mile, so that a reduction of about 25 per cent. in first cost only corresponds to a reduction of four or five per cent. in operating costs.

RUNNING COSTS.

It may easily happen that in reducing our first cost we shall reduce slightly the efficiency of our engine. Suppose that the better engine would take the vehicle ten miles on a gallon of petrol at half-a-crown a gallon. The petrol cost would be about threepence a mile. Suppose that the inferior engine would only travel eight miles to the gallon, the petrol cost would be nearly fourpence a mile, and the result would be that the cheaper machine would result in a worse balance-sheet, because the extra cost of fuel would more than balance the reduced depreciation allowance.

This illustration may be serviceable because it is taken from a well-known system of transport, the costs of which have been thoroughly analysed for years past. Despite these facts, there are still many purchasers of commercial and public service motor vehicles who remain obsessed with the idea that the thing which matters most, and almost the only thing which matters at all, is a reduction in the first cost of the vehicle. There never was a bigger mistake, and I sincerely hope that the same error will not be made in the early stages of the development of commercial aeronautics.

THE AERIAL FUEL OF THE FUTURE.

Under the above heading one, "Medway," sets forth in THE AEROPLANE, of May 24th, reasons why alcohol should be regarded as the fuel of the commercial aeroplane of the future.

The arguments which he advances as evidence that some source of fuel supply must be found other than the existing petroleum fields are sound and unanswerable.

His contention that alcohol is the solution of the difficulty is as certainly untrue, particularly in regard to aircraft.

Alcohol, like all other possible fuels, is a compound of carbon and hydrogen, and it is upon the carbon and hydrogen content that its heating value, and therefore its power value, depends.

Roughly, pure alcohol consists of 53 per cent. by weight of carbon, 13 per cent. of hydrogen and 35 per cent. of oxygen.

The oxygen content is chemically combined with part of the hydrogen. From the fuel point of view this may be considered as meaning that one third of the hydrogen content of alcohol is already burnt, and has combined with the oxygen to form water, and that this water forms nearly 40 per cent. of the total weight of alcohol.

The petroleum type of fuel contains from 1 to 3 per cent. by weight of oxygen only, and practically the whole of the carbon and hydrogen content is useful fuel.

As a result the heating value of alcohol is roughly 11,500 British Thermal units per lb. of fuel, against 18,000 to 20,000 for oils of the petroleum series.

This means that for the same engine efficiency the fuel consumption per h.p. hour of alcohol will be as 18 : 11.15 or as 1.53 to 1 compared with the consumption of a poor fuel of the petroleum type. Actually the alcohol engine can be made rather more efficient than the petrol engine, but 18,000 is a low figure for petrol.

For the commercial car this is unimportant.

For commercial aircraft it is of immense importance.

It will, for instance, reduce the maximum ton mile capacity of aeroplanes by about 35 per cent.

Apart altogether from this aspect of the problem alcohol shares with petrol the qualities of great volatility and ready inflammability. These are essential features of any fuel for engines of the type now used in aircraft. In consequence, the fire risk on aeroplanes is now very great, and will continue to be so if alcohol is used.

A number of competent engineers who have studied the question hold that it would even now be possible to design engines of large power—750-h.p. and upward—working on heavy oil, which would compare favourably with the petrol engine of to-day on the weight per h.p. basis. The fuel consumption of such engines would be, if anything, lower than that of the petrol engine, and the fuel would be of a cheaper grade.

The risk of fire with such fuel would be small, since it would be neither volatile nor readily inflammable.

Therefore before deciding to stake the future of commercial flying upon schemes for the development of new sources of fuel supply it is rather important to consider whether such schemes will be able to supply fuels which may be demanded in the near future.

Neither alcohol nor any of its immediate derivatives possess the necessary qualities for use in the "heavy oil" type of engine.

Liquid hydro-carbons with fuel qualities similar to those of the petroleum series can be produced by distillation from an enormous number of organic substances.

Coal, shale, peat, and wood, distilled in a retort similar to the gas retort which produces the town gas of commerce will all produce hydro-carbons of a full value approximately equal to that of petroleum, and in all probability any substance from which alcohol can be produced by fermentation would yield a better fuel if subjected to a suitable distillation process.

Before the outbreak of war a process of coal distillation had been developed in this country—naturally enough by a gentleman of German birth and of the name of Müller—in which, by the control of the temperature and pressure of distillation a very large variation in the nature of the distillate can be secured

In addition to the normal yield of coke, gas suitable for gas engines and tar, somewhere between 25 and 40 gallons of oil per ton of coal could be obtained. The nature of the oil produced could be varied at will from about 25 per cent. of a fuel corresponding in its qualities to petrol, with 75 per cent. of heavier oils, to a mixture entirely composed of heavy oils and containing a very small amount of volatile matter.

It is understood that the Admiralty showed no particular interest in this process till well on in the war, when Mr. Müller was removed to some far off part of the country, and set to work upon the experimental distillation of peat.

What results he has obtained are not known, but it is known that quite a good yield of fuel oil can be obtained from peat.

This being the case it is probable that fuel oils can be distilled from almost any vegetable matter such as, for instance, sawdust and shavings, and if the nature of the oil yield can be controlled in the manner indicated above, then there is a source of fuel available which will supply either the volatile fuel necessary for the aero-engine of to-day, or the heavy fuel for the engine of to-morrow.

The coal yield of England is roughly 200,000,000 tons per annum. Distilled, this will provide round about 50,000,000 gallons of oil of varying grades, and the remaining products, coke, gas, etc., used in economical furnaces, and power plants could supply more than the total heating and lighting demands of to-day.

If all the other possible sources of oil were treated by similar processes the effective fuel resources of the Empire could be trebled.

It is thus that the aerial fuel of the future is to be sought.

FICTITIOUS FIGURES ON FLYING.

The following letter has been received :—

Sir,—In your issue of May 21st, "Commonsense" attacks the figures given both by "Engineer Officer" and by myself in connection with the cost of aerial transport.

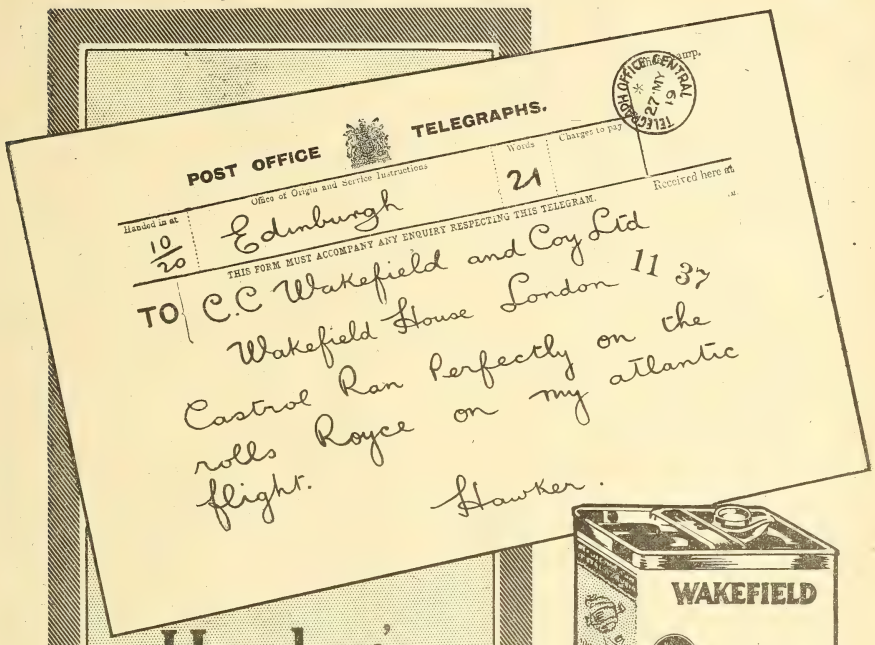
In the main his quarrel with my figures is based on the actual capacity of the assumed machines to carry the required loads at the speed necessary to run to the schedule, and upon the alleged impossibility of flying day and night on 300 days in the year.

So far only two specific types of machine have been mentioned by name. I myself mentioned the Handley Page V/1,500 type, and "Commonsense" advances the Bristol Bomber. Neither of these machines is capable of running to "Engineer Officer's" schedule of 100 m.p.h. with the loads assumed. Nor were either of these machines designed for such a purpose.

It was perhaps not made properly clear in my letter that I did not contemplate using the existing Handley Page type for such a service. What I had meant to imply was that, given the power plant of the V/1,500 and a total loaded weight of 25,000 lbs., it ought to be possible to design a machine with fuel capacity for 6½ hours at 100 m.p.h. air speed, but with a paying cargo capacity of two tons, which would have a sufficiently high maximum speed to run to the 100 m.p.h. schedule. This can be done easily, though possibly at a sacrifice of the ceiling of the existing machines.

With regard to the possibility of flying on 300 days per year, I think this may easily be reached in many places outside of this country. There are no 5,000-mile routes available within the British Isles, and, flying eastward from Britain, the end of the first 500-mile stage will land one well outside the fog-bound area. Even in the present state of aerial route organisation I believe many 5,000-mile routes could be planned upon which the 300-day schedule could be run to.

Ex-R.N.V.R.



Hawker's own words

are unsolicited evidence of the absolute reliability of

WAKEFIELD Castrol REGD. (R)

Moreover, Castrol is the chosen lubricating oil of every British entrant in the trans-Atlantic flight. What greater evidence of its superiority do you want?



C. C. WAKEFIELD
& CO., Ltd., Wakefield House,
Cheapside, London, E.C. 2.

CIVIL AERIAL TRANSPORT NOTES.

The first regular aviation meeting at Hendon since the war took place on May 31st and June 1st.

The meeting was arranged to celebrate the return of Mr. Hawker, who arrived at the aerodrome in a Sopwith "Gnu" (230 h.p. B.R. II.), with Mrs. Hawker in the passenger seat. He was met by many other machines, which formed an escort.

As there was a great demand for a flight with Mr. Hawker, 10 tickets were sold by auction, and the first was knocked down at 60 guineas to Miss Daisy King, of Leeds. Flight No. 2 was sold to Mr. Mansfield, of the Ascol Company, for 40 guineas, and the third ticket, auctioned by Mrs. Hawker, also fetched 40 guineas, which will be handed over to the Flying Services Fund. The remaining seven flights realised sums ranging from 10 to 20 pounds.

A highly interesting performance was put up by the new Boulton and Paul machine fitted with two 320-h.p. Dragonfly engines. This impressed the experts even more that it did the mob.

The big machine did not appear to run more than 25 or 30 yards before the wheels were off the ground, the rate of climb appeared to be extremely good, and it performed the most perfect loops one could wish to see. On Sunday the machine caused vertical gusts among the crowd by diving at great speed till within about 200 feet of the ground before flattening out.

This big twin-engined biplane was flown from Norwich to Hendon in one hour with three passengers. In appearance it is extremely attractive, and its performances in the air proved that it could stunt almost like a scout.

On Saturday afternoon the Vickers Vimy (two Eagle VIII. Rolls-Royce engines) arrived, having flown from Dartford to Hendon in 15 minutes. It was piloted by Capt. Stanley Cockerell.

The Vimy very nearly approaches one's youthful dreams of the flying machine. There are luxuriously upholstered seats for 11 passengers and a porthole by each seat. Ladies who crowded round it said it was "a dream," and some youthful scout-pilots thought the makers might have installed a silver grill and a jazz band to make it complete.

The machine is known as the "Commercial," and, except for the body, is identical with the one in which Capt. Alcock intends to make an attempt to cross the Atlantic.

Early on Saturday afternoon there was an accident to a Blackburn "Kangaroo" machine (2 Rolls-Royce Falcon engines), which resulted in Captain Robertson, the pilot of the machine, suffering slight concussion and extensive bruises, and Private H. Cox, of the 18th Canadian Reserve Battalion, sustaining a broken thigh.

The following interesting table appeared in the "Daily Telegraph" on Monday:—

"Some of the visitors, officials, and pilots at Hendon aerodrome yesterday and on Saturday must have thought of the last flying meeting held there on August 1st, 2nd, and 3rd, 1914. On the Bank Holiday the programme was entirely upset by war preparations and sudden Government orders. Some of the French aviators were already on the wing, bound for France.

"A comparison of the machines at Hendon on that occasion to those seen yesterday is extremely interesting. Then the following took part:—

Pilot.	Machine.
R. J. Lillywhite	Grahame-White biplane, 50 h.p.
W. L. Brock.....	Morane monoplane, 80 h.p.
Louis Noel.....	Morane monoplane, 80 h.p.
F. G. Dunn.....	Grahame-White biplane, 50 h.p.
A. E. Barrs	Grahame-White biplane, 50 h.p.
H. Salmet.....	Blériot monoplane, 50 h.p.
Birchenough.....	M. Farman biplane, 80 h.p.
L. Noel.....	H. Farman biplane, 80 h.p.

1919.

1. H. G. Hawker, Sopwith Gnu, 200 h.p. B.R.
   H. G. Hawker, Sopwith monoplane, 130 h.p. Clerget.
2. Capt. P. R. T. Chamberlayne, Grahame-White Bantam, 110 h.p. Le Rhone.
3. Clifford B. Prodger, B.A.T. Bantam, 170 h.p. Wasp A.B.C.
4. Major R. H. Carr, A.F.C., D.C.M., Grahame-White, 110 h.p. Le Rhone.
5. Capt. Cockerell, Vickers Vimy, 2-350 h.p. R.R. Eagle.
6. Capt. D. H. Robertson, A.F.C., Blackburn K, 2-350 h.p. Rolls-Royce.
7. Major C. Draper, D.S.O., B.A.T. Bantam, 170 h.p. Wasp A.B.C.
8. Lieut. Courtney, Boulton and Paul, ——
9. W. E. Birchenough, Airco D.H., 350 h.p. Rolls-Royce.
10. Lieut. G. R. Hicks, Avro, 110 h.p. Le Rhone.
11. Capt. D. Allen, Sopwith Gnu, 200 h.p. B.R.
12. Capt. Barnard, Sopwith Gnu, 200 h.p. B.R.
13. Capt. C. R. Vaughan, B.A.T. Bantam, 170 h.p. Wasp A.B.C.
14. Lieut. C. Turner, B.A.T. Bantam, 170 h.p. Wasp A.B.C.
15. Lieut. R. E. Duke, B.A.T. Bantam, 170 h.p. Wasp A.B.C.
16. Lieut. Louis Noel, Avro, 110 h.p. Le Rhone."

On Sunday, Lieut.-Commander Read paid a visit to Hendon, and of course was given a great reception. He witnessed a magnificent exhibition of stunting.

The Supermarine Programme.

The following extracts concerning the work of the Supermarine Co. are taken from a Southampton paper:—

The Supermarine Aviation Company, of Woolston, are completing their arrangements respecting the flying-boat service which they will inaugurate (subject to Government licenses being obtained in time) at Whitsuntide. It is the intention of the Company to concentrate on short flights with passengers. The latter will embark from the various pier heads at the Island towns, which will figure as stopping-places on the circular route which the seaplanes will cover. It is proposed that these places of call will include Ryde, Ventnor, Sandown, and Shanklin. The tour will extend to Bournemouth and Weymouth, and also later on probably to Le Havre and St. Malo.

One of the Supermarine Aviation Company's directors, Commander J. Bird, who was accompanied by Squadron-Commander B. S. Hobbs, D.S.O., D.S.C. and bar, visited the Island towns last week, settling final details with regard to the moorings.

Ten machines (each machine to carry three passengers) will comprise the service, and the same machine will not fly two days in succession, as the method will be for five machines to carry on in alternate squadrons of that number with a day in between for expert examination and regular overhauling of the machinery for the following day's flying.

On Sunday evening Squadron-Commander B. S. Hobbs, D.S.O., D.S.C. and bar, made an exhibition flight in one of the flying-boats, which proved thoroughly successful, and which was watched from the Royal Pier and along the Western Shore by interested onlookers. Squadron-Commander Hobbs has seen distinguished service during the war, and the Company is fortunate in retaining the services of such an experienced chief pilot. All the pilots who will take the flying-boats on the new service are ex-Royal Naval Air Service men, who have specialised in the type of machine to be used in the passenger service.

Flying in the North.

At Blackpool and Southport between 700 and 800 passengers were carried last week in three-seater Avros. The local service between Blackpool and Southport across the estuary of the river Ribble is very popular. The train journey takes well over two hours between these two towns, but by air the journey is completed in 10 or 12 minutes. Already business men are making use of the new means of transport.

Both aerodromes have been fenced off with rope and barricades (in the case of Blackpool by the Corporation), and the crowds which gather daily to watch the machines are becoming more and more educated in flying matters. Newcomers, however, are still anxious to learn, and the old lady who asked what the block of wood in front of the engine was use for was quite interested on being told it was the propeller used for keeping the engine cool.

The Avro Company hope to have their new four-seater 200 h.p. machines ready for Whitsuntide, when daily services to Manchester, Lancaster and Llandudno should be in full swing.

At Hounslow.

Over 600 passengers were taken up during the week at Hounslow. A new machine has been in use, an Avro Limousine, and this made a trip to Margate and back on May 28th. There was also a trip to Eastbourne and back. Twenty-five trips were given for the Theatrical Garden Party, and these were auctioned in Mr. André Charlot's Monte Carlo.

Aerial Postal Services.

The Post and Telegraph Committee of the London Chamber of Commerce, convinced that aerial postal services will be of great value to the commercial community, have passed a resolution declaring themselves strongly of opinion that the Postmaster-General should immediately make arrangements whereby private organisers who propose to institute aerial services may be enabled to carry and specially deliver letters on payment of the current postal rates and the necessary surcharge.

Stonehenge to Hendon.

On Saturday an Airco 16 machine flew to Stonehenge and collected Brig.-General Heane (1st Australian Division), Lieut.-Colonel Moorhead, Lieut.-Colonel James, and Lieut.-Colonel McArthur, and brought them up to Hendon in 55 minutes to witness the flying display given in honour of Mr. Hawker. They returned to dinner at Stonehenge in the evening by air, taking approximately the same time as before.

On Sunday four more Australian officers (including Colonel Knox and Colonel Beardsmore) were taken to Hendon in under one hour from Stonehenge, and conveyed safely back again.

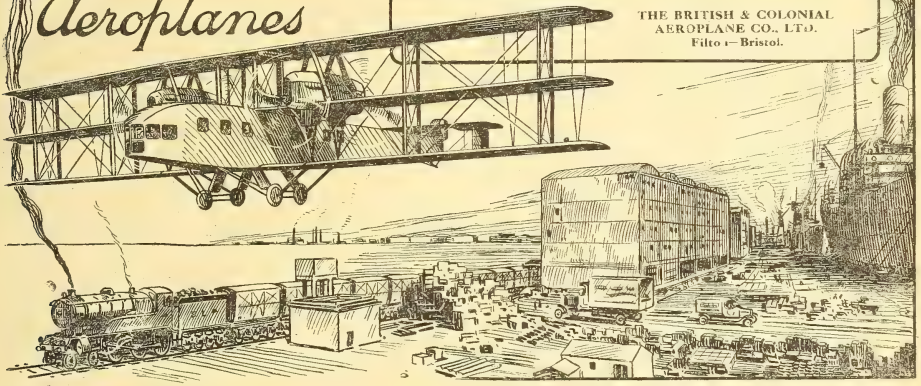
The "Bristol" Aeroplanes

Telegrams—"Aviation, Bristol." Telephone—3906 Bristol.

SPEED.—
RELIABILITY.—

These are the main features which commerce demands of aerial transport, and they are the dominant features of the "BRISTOL" commercial aeroplanes. No other large passenger and freight-carrying machines yet constructed can travel at 125 miles per hour as do the giant "BRISTOL" Triplanes, nor is there any other large machine comparable with the "BRISTOL" Triplane in point of ease of control and general reliability. The "BRISTOL" Triplane is only one of the many "BRISTOL" aircraft of all types constructed for the requirements of commerce of which full particulars will be sent on application.

THE BRITISH & COLONIAL AEROPLANE CO., LTD.
Filton—Bristol.



Allen
PISTON RINGS

give

More Power and Speed and Gas-tight Pistons

A uniformly and accurately "stressed" ring by mechanical operation

ALLEN & SIMMONDS, Ltd.,
Piston & Piston Valve Engineers
READING



General Brancker at Cheltenham.

On Saturday, May 24th, Major-General Sir Sefton Brancker, K.C.B., piloted by Capt. W. G. Gathergood, flew from Hendon to Salisbury in a three-seater Airco 9 machine. Stopping the night at Salisbury, he flew on to Cheltenham on Sunday morning to inspect a suitable aerodrome in that vicinity, and after making a thorough investigation from the air of the aerodrome and surroundings landed at Rendcomb.

The return journey to Hendon was made from Rendcomb at 6 o'clock, and Hendon was reached in 40 minutes.

Italy.

According to a message, dated May 29th, the Italian Government has informed the Greek Government that it will give effect to the Convention recently signed between the two countries for an aerial mail service. Two aerodromes are to be established, the one at Corfu, the other at Brindisi.

Brazil.

Handley Page, Ltd., have announced that a Brazilian-Argentine aerial mail service will start on July 1st. Preparations are being made and landing sites have been bought along the Atlantic from Pernambuco to Buenos Aires.

THE PETTICOAT LANE OF AIRCRAFT.

On June 2nd, at the No. 1 Aircraft Salvage Depot, The Hyde, Hendon, was held the first of a series of auction sales of aircraft and aircraft materials, etc., consisting of six Avros, two Armstrong-Whitworth F.K.8s., two B.E.2es., and six D.H.6s., all alleged to be in flying condition and ready to "drive away," together with a large amount of woodwork, mainly struts, skids, propeller cases, etc., canvas, copper, brass, and other metal oil and petrol tanks, rope, scrap timber, wings, etc.

Perhaps owing to the short notice given of the sale, there were not very many buyers, but among that number were a few of that class of person which one always finds on occasions when it is possible to get something for nothing, or as near as may be, and judging from the prices given for articles one could see that the Disposal Board would not lose much by giving the stuff away.

Lots 1—129 consisted mostly of lots of anything from 100—700 ash or spruce struts or skids, and these were principally snapped up by people who, judging from their appearance, were far from being connected with the aircraft business. In fact, one can almost foresee an influx on the market, principally in the East End, of large quantities of genuine antiques, complete with wormholes and cobwebs, which, if one could trace their history sufficiently far back, would be found to consist of genuine ash and spruce taken from a perfectly good Maurice Farman "Shorthorns."

Again, if any furniture dealer could forsake the artistic for the original he might give the pedigree of his wares, whereby any hardened air-fighter would be able to purchase a back-rest or a foot-stool fashioned from the "Rumpety" on which he made his first solo.

Any enterprising farmer who desires to be up to date could, by finding out the direction of the prevailing winds over his land, erect an excellent streamline fence composed of "Avro" struts. Also, if one expected a shortage of fuel for the coming winter, a bundle of 950 solid spruce struts, 60 in. by 4½ in by 1¼ in. would make up into excellent bundles of firewood. In fact, the scope for originality and usefulness is unlimited.

After the auctioneer had disposed of the first 30 or 40 lots, the interest in struts palled, so that by special request lots 274 to 288 were disposed of. This aroused the most interest of the afternoon and also caused the biggest surprise.

The first machine, a 110-h.p. Le Rhône "Avro" fetched the huge sum of £360, which incidentally was the biggest bid of the afternoon. The other five Avros fetched anything from £360—£300.

The two Ack-Ws. both fell to the hammer for £260 each; two B.E.2e's with 90-h.p. R.A.F. engines fetched £90 and £80 respectively, and the remaining six machines, all D.H.6s., fitted with either 80 h.p. Renault, 90-h.p. R.A.F. 1a and Curtiss O.X.5 engines (the latter engine, incidentally, being acclaimed by the auctioneer as the finest American aero-engine ever used in this country barring the Liberty), going for anything from £100 to the beggarly sum of £60. The latter sum was the price given for a D.H.6 arranged as a single-seater and fitted with the aforementioned famous Curtiss engine.

As this sale was the first of its kind, and only arranged more or less as an experiment, one could not form a reliable opinion as to how the second-hand market for aircraft is likely to develop, but a more ambitious sale is to be held on the 23rd of this month, and one ought certainly to expect quicker and keener bidding and highest prices.

Certainly the fact that one can pick up a serviceable aeroplane for an odd £100 or so, ought to have an effect on certain demobilised R.A.F. sportsmen who have been and still are awaiting delivery for cars at twice their pre-war price.—L. L. B.

THE HOUNSLOW AERODROME.

In future the aerodrome at Hounslow will be reserved entirely for civilian flying, and R.A.F. machines will land there only in cases of emergency.

R.A.F. machines using any aerodrome not owned by the Government will, for the present, pay the ordinary civilian fees.

A RESIGNATION.

Mr. R. L. Desoutter, who is well known as one of the most successful test pilots, both of land machines and seaplanes during the war, notifies the fact that he has resigned the position of manager at the works of the British Caudron Company, Ltd., at Alloa, as from May 24th, and that he is now free to consider any proposition from firms who are interested in aeronautical ventures.

His long and varied experience as a test pilot should make him of very great value to firms engaged on experimental work, and his proved business capacity fits him for some position very much more responsible than that of test pilot alone.

Letters addressed to Mr. Desoutter at this office will be forwarded to him promptly.

A RETURN TO BUSINESS.

One learns that Lieut. Ernest Allingham, R.A.F., has quite recently returned from Cologne, and that he is to be demobilised in a few days. Mr. Allingham is a partner in the old-established and well-known firm of advertising consultants and service agents, J. C. Francis and Co., of 131, Fleet Street.

He has been in the R.A.F. for three years, and had eight months' experience of war-flying, during which time he spent 250 hours over the enemy lines as pilot of a Bristol Fighter. He was shot down a few days before the signing of the armistice, but fortunately managed to land inside our lines without serious mishap. Back to his old business once more, he is taking control of the Aviation, Motoring and Engineering Departments, and his added experience and knowledge should prove of very great value to both his firm and their clients.

Mr. Allingham is as full of enthusiasm regarding aviation as he is about advertising, and he intends to use his aeroplane to pay flying visits to his many clients in various parts of the Kingdom. It is interesting also to know that this firm (J. C. Francis and Co.) are in a position to take orders for the transport of passengers by aeroplane either for business or pleasure, and they welcome inquiries on the subject from any firm or individual who is interested.

J. C. Francis and Co.'s new watchword is—"We go anywhere for business—by aeroplane."

A FINE ADVERTISEMENT.

The Aircraft Manufacturing Co., Ltd., are producing a series of picture post-cards of various modern Airco machines, such as the D.H.9, and 10, the Limousine and the Liberty 4. These post-cards are genuine photographs and not merely prints, and are beautifully produced. It is the intention of the Aircraft Co. to supply these at 1s. per set of six to anyone applying to the firm at Edgware Road, The Hyde, Hendon, and it is hoped that large supplies for this purpose available for the public will be ready very soon.

It strikes one that this generosity is going to cost the Aircraft Co. a lot of money, for one has never yet seen photograph post-cards of such quality or of greater interest sold so cheaply, and one advises those who desire to have copies to apply for them at once.

A VISIT TO THE NORTH BRITISH RUBBER COMPANY.

On May 22nd, the Lord High Commissioner for Scotland, the Duke of Atholl, the President of the Royal Aero Club, who is at present in Scotland in connection with his duties as High Commissioner, paid a visit to the works of the North British Rubber Company at Castle Mills. This firm was a pioneer rubber-proof balloon fabric, and has been long connected with the Aircraft Industry. The Cadets and Girl Guides of the works formed a Guard of Honour which the Duke of Atholl inspected before entering the works. Mr. Alexander Johnston received His Grace.

AN EXPENSIVE AMUSEMENT.

At Bow Street Police Court on May 31st, before Mr. Garrett, Robert Andrew Scott, 21, and Harry George Stone, 18, both of the H.A., were charged with stealing and receiving a Crossley motor-car, valued at £800, the property of the Air Ministry.

Scott told the magistrate that he and the other defendant noticed the car unattended in the Strand, and thought they would go for a ride. He was arrested as an absentee on the day he sold the car.

Lieut. Horace Whitley, R.A.F., stated that some of the accessories were missing and two of the figures on the identification plate had been painted out.

In reply to the magistrate, the witness said that anyone with mechanical knowledge could see that the number had been altered.

The defendants were committed for trial.

THE OLD STORY.

Capt. H. J. Saint, No. 1 pilot, of the Aircraft Manufacturing Co., collided with a hill near Portsmouth at 5 a.m. on May 1st, while flying a D.H.9 at 90 m.p.h., with copies of the "Daily Mail" from Hendon to Bournemouth.

Capt. Saint fractured his jaw and his machine was completely wrecked, but as he was wearing Triplex Safety Glass goggles his eyesight was saved.

AIRCRAFT FINANCE

PARTICIPATING POLICIES FOR AVIATION INSURANCE.

It has been decided to inaugurate a scheme of participating policies in respect of aircraft insurance. Those who have been disposed to complain about the premiums quoted for aviation risks should derive some satisfaction from this important decision of the Aviation Insurance Association. Participating policies, it need scarcely be said, are quite common features of ordinary life assurance business, and are greatly appreciated by many people.

A Challenge to Critics.

Let it be clearly understood that this present innovation covers accidental damage to aircraft only. Quite frankly it is admitted that it has been instituted to meet the requirements of those owners of aircraft to whom the rates charged for accidental damage may seem at the present time excessive. As there are people who cannot be convinced that the present scale of premiums is reasonable, the idea of the Association is to remove the objection by issuing a participating policy whereby the excess profit, if any, will be returned to the insured.

Pooling the Premiums.

By this scheme the insured will participate in 50 per cent. of the profit derived from aircraft damage insurance business. The whole of the premium derived from participating aircraft business will be pooled, and the insured will, as soon as the underwriting accounts for the year have been closed, participate in the specified proportion of the profits according to the amount of premiums paid.

A Corrective.

In no case, it is pointed out, will the amount payable under the scheme be more than 75 per cent. of the actual profit on the policy in question, and where a policy has made a loss to the underwriters there will naturally be no return made. It is argued that in this way an efficacious corrective will be automatically applied, should experience substantiate the contention that the present level of rates is excessive. Owners of aircraft doubtless will feel that they have scored in such circumstances, and the underwriters will be equally satisfied in view of their assertion that their policy is to provide reasonable insurance facilities to the aeronautical trade at a reasonable scale of remuneration.

A Rock Bottom Basis.

Without a doubt there are critics who will attempt to prove the faults of the new scheme. It is not faultless. Is there anything on earth that is faultless? One must admit, however, that it is a serious attempt to bring the youthful business of aviation insurance down to a rock-bottom basis. As yet it is not sufficiently old to have proved its limitations and its capabilities, but the participating innovation should accelerate the movement towards that goal.

"Loaded" Premiums.

It will be suggested, one may be quite certain, that the participation scheme is so simple as to create suspicion. What would prevent the underwriters from "loading" the premium on participating policies and thus recouping themselves for the privilege offered to the insured at the initial expense of the insured? But the underwriters frankly and openly assert that they have no intention of "loading" the premiums purposely to cover the additional accommodation.

Results Would Tell the Tale.

Anyway, at the end of the year when the pooling of profits or losses is made, an excessive premium would be at once proved by the scale of profits made. The insured would in such circumstances receive a big sum. In that event the proof of excessive premiums would be established, and the aeronautical trade would be justified in demanding that a more reasonable scale of premiums be established without delay.

Stipulations Explained.

What else could be proposed in order to carry conviction? One suspects the stipulation that the clause "in no case will the amount payable under this scheme be more than 75 per cent. of the actual profit on the policy in question" will provoke discussion, but it is obvious that, when the whole of the results are pooled and the distribution of the profit is made in proportion to the individual totals of the policies outstanding, the question of working expenses must be taken into consideration as well. Where a policy made a loss to the underwriters, no one expects anything to be returned.

Furthermore, the accounts being made up only when the risks of the underwriting year have been closed, no provision is necessary for unexpired risk or for outstanding claims, and the amount of profit can be calculated, therefore, on a very simple basis. This simplicity is an advantage.

Helpful for Efficiency.

It is almost superfluous to point out that the participating policy is calculated to put a premium on efficiency, and to inspire a more reasonable degree of caution in the methods of the owners of aircraft.

Wm. J. Davies.

CURRENT TOPICS.

Whiteheads Want More Capital.

Just at present the Financial World is in the doldrums, and until the big Funding Loan is out of the way there is an idea that conditions will remain slack. It would not be surprising, however, if occasional spasms of buoyancy developed. By the way, the directors of Whitehead Aircraft (1917), Ltd., are appealing to shareholders to provide £50,000 in the form of 10 per cent. Notes repayable at par on or before June 1st next year. These are offered at 98, and in view of the position, discussed last week, one fears that the appeal will be in vain. The intention is to enter the motor-car business. The development is interesting but calls for no comment.

Surveying Air Routes.

It transpires that a new venture, entitled the Aircraft Communication and Meteorological Survey Co., Ltd., has been formed for the purpose of making surveys for air routes and to negotiate and obtain contracts for building them. The initial capital is £2,000. The idea is novel and one need not say anything more about it.

Napiers and the Government Policy.

Some pertinent and interesting remarks concerning the official policy in regard to aviation were made at the shareholders' meeting of D. Napier and Son:—

As stated in the report, important progress in the development and manufacture of aero-engines has been made by the company during the past year, but I regret to say that while apparently foreign countries recognise the advisability of fostering such business, aero engine manufacturers in this country are not receiving encouragement from the British Government to continue

the manufacture of such engines. At the present time, so far as your company is concerned, we expect to shortly complete our present contracts for Napier aero engines for the Government. You are aware that your company was the first to originally produce the six-cylinder engine car successfully, and our aim now is to produce a model which will far surpass anything of its kind made heretofore. However, the aero-engine has taken many years of experience and skill to bring it into successful production, and having gone through that stage we are desirous of retaining that practical knowledge for the benefit of future aviation, and we venture to hope that the Government will yet see that it would be false economy to allow this experience to be practically abandoned instead of spending a reasonable sum to maintain British supremacy in the air. There is no doubt that commercial aviation will come in time, but it is the period between now and then in which manufacturers of aero engines and aircraft should receive every encouragement from the Government to keep their experienced and skilled people actively employed in the manufacture and development of this class of work if we, as a nation, are to be prepared to hold our own in the air in the future."

NAVARRO-WELLESLEY AVIATION DEAL.

Quite recently—it was in April to be precise—the Wellesley-Brown Aircraft Co. appealed to the investing public to subscribe for capital. It now transpires that freehold premises at Kingston-on-Thames have been acquired. Adjoining buildings and land also purchased will permit, it is claimed, of future extensions. The benefit of existing Admiralty contracts of the London and Kingston-Boat and Motor Co. are included in the purchase.

The entire undertaking of the Navarro Aviation Co., of Burton-on-Trent, has been purchased as well, the consideration being £20,000, of which £10,000 is to be in fully paid shares, with the stipulation that if £40,000 cash is raised in respect of additional capital before Oct. 31st next, the balance of £10,000 to the Navarro Co. will be paid in cash, failing that, 25 per cent. of the net subscription as reserve and the residue in fully paid Wellesley shares. The name is to be changed to Navarro-Wellesley Aviation, Ltd.

ROVER CAPITAL TO BE INCREASED.

Rover shares have been active of late, and it now transpires that the capital is to be increased to £500,000, and that shareholders will be offered 150,000 new shares pro rata at a premium yet to be decided.

NEW COMPANIES.

SHORT BROTHERS (ROCHESTER AND BEDFORD), LTD.—Private company. Registered May 28th. Capital, £150,000 in £1 shares. To take over the business of aeronautical engineers carried on by Short Brothers, at Rochester, at Cardington, Beds., at Battersea, S.W., and at 29-30 Charing Cross, S.W., and with a view thereto to enter into two agreements with A. E. and H. O. Short. The subscribers (each with one share) are:—H. O. Short, Norfolk Lodge, Borstal Road, Rochester, aeronautical engineer; A. I. M. Duncan, 21, Leadenhall Street, E.C., solicitor. First directors: H. O. Short, A. I. M. Duncan, and E. B. Parker. Registered office: 29-30, Charing Cross, S.W.

AUTOMOBILE AND AIRCRAFT INSURANCE CO., LTD.—Registered May 26th. Capital, £100,000 in £1 shares. To carry on vehicle, motor, cycle, aircraft, glass, boiler, engine, electric plant and general insurance (but *not* life, fire, accident, or employers' liability insurance or bond investment business within the meaning of Section 1 of the Assurance Companies Act, 1909). The promoters are the General Accident, Fire and Life Assurance Corporation, Ltd. No promotion money is payable and no material contracts have been entered into. The preliminary expenses are estimated at £500. Minimum cash subscription 5,000 shares. The first directors are:—Rt. Hon. Lord Morris, P.C., K.C.M.G.; F. Norrie-Miller, J.P., F.E.I.S., Cleeve, Perth, N.B.; Sir John Taverner, K.C.M.G., Bexley; Col. S. Wishart, Wilbury Lawn, Brighton; J. R. Yates, Boscobel, Oakhill Avenue, Hampstead, and P. F. Brittain, South Cliff Avenue, Eastbourne. The first named are directors of the promoting company. Qualification £250. Registered office: General Buildings, Aldwych, W.C.1.

CUBITTS ENGINEERING CO., LTD.—Registered May 27th. Capital £600,000 in £1 shares (250,000 7½ per cent. cum. pref.). To enter into two agreements with Holland and Hannen and Cubitts, Ltd., and to carry on the business of manufacturers of, wholesale and retail dealers in, letters to hire and importers and exporters of motor vehicles, ships, boats, airships, flying machines, and the wheels, tyres, engines, bodies, parts, and components thereof and accessories thereto, rubber and rubber goods manufacturers, etc. Minimum cash subscription 7 shares. The first directors are:—E. C. Hannen, 7, Park Lane, W., director of Holland and Hannen and Cubitts, Ltd.; G. R. Holland, Langley House, Kings Langley, Herts, director of Holland and Hannen and Cubitts, Ltd.; E. M. May, Harperbury, Radlett, Herts, director of Holland and Hannen and Cubitts, Ltd.; H. J. Joseph, Woolley Hall, Maidenhead, financial manager to Holland and Hannen and Cubitts, Ltd.; J. Putnam, Hayden Hill House, Aylesbury, director to Gunter and Co., Ltd., and R. G. Paget and Sons, Ltd.; P. L. H. Dodson, 21, Ravenscourt Park, W.6. Qualification, £1,000. Remuneration £150 each per annum, increasing to £300 according to dividends. Solicitors: Grundy, Kershaw and Co., 6, Austin Friars, E.C.

AEROFILMS, LTD.—Private company. Registered May 9th. Capital, £3,000 in £1 shares. Supplying cinematograph films of aerial incidents. The subscribers (each with one share) are:—G. Reader, 35, Coleman Street, E.C., solicitor; W. A. Chadwick, 35, Coleman Street, E.C., solicitor. Directors: C. Grahame-White, F. L. Wills, and H. W. Matthews. Solicitors: G. Reader and Co., 35, Coleman Street, E.C.2.

FAIREY AND CHARLES, LTD.—Private company. Registered May 14th. Capital £50,000 in £1 shares. Manufacturers and dealers in motor-cars, carriages, cabs, omnibuses, vans, cycles, ships, launches, boats, aeroplanes, water-planes, flying boats, and other public and private conveyances, whether propelled by petrol, steam, electricity, or other power, etc. The subscribers (each with one share) are:—E. A. Fairey, Grove Cottage, Iver, Bucks, engineer; F. M. Charles, Brackenwood, Iver Heath, Bucks, engineer. Managing directors:—C. R. Fairey and F. M. Charles. Solicitors:—Ashurst, Morris, Crisp and Co., 17, Throgmorton Avenue, E.C.2.

W. H. HARRISON (BURNLEY), LTD.—Private company. Registered May 12th. Capital £20,000 in £1 shares. Aeronautical, automobile, marine and general engineers. The subscribers (each with one share) are:—W. H. Harrison, 110, Melville Street, Burnley, motor engineer; Roland Taylor, 51, Kay Street, Rawtenstall, master porter; J. C. Parkinson, 47, Burnley Road, Rawtenstall, motor engineer. Directors: W. H. Harrison, R. Taylor and J. C. Parkinson. Solicitors: J. C. Waddington, Imperial Chambers, Grimshaw Street, Burnley.

A. E. Co., LTD. Private company. Registered May 9th. Capital £1,000 in £1 shares. Aircraft, mechanical, electrical, marine, motor and general engineers, etc. First directors: H. J. Heasman, 60, Grove Road, E.17, engineer; J. J. Clifford, 49, Cleveland Park Avenue, E.17, engineer; J. E. Clark, 10, Redbourn Avenue, N.3, C.A. Registered office: 59, Chancery Lane, W.C.

ANGLO-BELGIAN AVIATION AND MECHANICAL CO., LTD.—Private company. Registered May 9th. Capital £15,000 in £1 shares. To carry on business as indicated by the title. The subscribers are: T. D. Jones, Albermans House, Bishopsgate, E.C., general merchant; H. M. Carter, Alderman's House, Bishopsgate, E.C., general merchant. First directors to be appointed by the subscribers. Solicitor: H. S. Holt, 6, Gray's Inn Square, W.C.2.

PYROTECHNICS, LTD.—Private company. Registered May 14th. Capital £10,000 in £1 shares. Manufacturers of and dealers in fireworks, illuminants, marine, aerial and other signals, flares and coloured lights, sporting and blasting powders, etc. The subscribers are:—Major C. Etchells, D.S.O., M.C., 39, Tavistock Square, W.C.1, 500 shares; G. J. Jones, Aldine House, Belvedere, Kent, research chemist, 300 shares; C. R. Harler, 19, Mulgrave Place, Woolwich, S.E.18, research chemist, 300 shares. First directors: Major C. Etchells, D.S.O., M.C., signs as managing director, G. J. Jones and C. R. Harler.

FLYING BOAT CO., LTD.—Private company. Registered May 14th. Capital £50,000 in £1 shares. Manufacturers of and dealers in flying boats, seaplanes and aircraft generally, etc. The subscribers (each with one share) are: J. F. Seacombe and H. J. Gay, both clerks, of 8, Finch Lane, E.C.3. First directors to be appointed by the subscribers. Solicitors: Simmons and Simmons, 18, Finch Lane, E.C.

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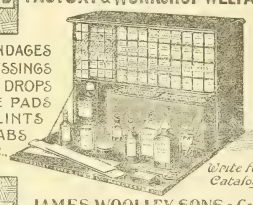
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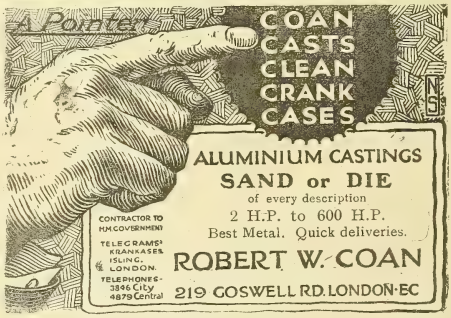
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AIRCRAFT IN PARLIAMENT

THE HOUSE OF LORDS.

THE CASE OF MISS PENNANT

On May 29th, Earl STANHOPE moved:—"That in view of the allegations made both in public and privately against Miss Violet Douglas-Pennant, this House is of opinion that a judicial inquiry should be held forthwith to examine the circumstances leading to her dismissal from the Royal Air Force." He said that the summary dismissal of Miss Pennant had created considerable interest throughout the country and had been the subject of debates in both Houses of Parliament. Miss Pennant was known to many of their lordships and was widely known throughout the country. She had 10 years' public service to her credit, nearly seven of which had been spent as an Insurance Commissioner for Wales. Yet this lady had been summarily dismissed from the Royal Air Force, and he could not understand why the Government should object to an inquiry.

When, on August 2th, Major-Gen. Brancker informed Miss Pennant that she was dismissed he said it was not because she was inefficient, but "because you are so unpopular with all who come in contact with you that nothing can be done with you while you are there." It was a new policy in this country for public servants to be dismissed because they were unpopular. He denied, however, that Miss Pennant was unpopular. She had been flooded with letters from persons who had worked under her and with her who said that they had much enjoyed working with her.

It was hardly surprising, in view of the way in which Miss Pennant was treated, that remarks were beginning to spread making attacks against her private life. Only yesterday a rumour reached him to that effect in the City, and Mr. Tyson Wilson, who was the Whip of the Labour Party, had said to several witnesses that charges had been made against Miss Pennant of so serious a character that, if they were published, she would never hold up her head again, that her public career was not all as good as it was painted, and Mr. Wilson recommended those who were talking to him to have nothing to do with it, or they also would suffer. It was true that Mr. Tyson Wilson had denied that statement, but it was made in the presence of witnesses.

Mr. Cecil Harmsworth had written Miss Pennant a letter in which he used these words:—"I have strongly recommended that a Judicial inquiry should be held." And he wrote again just before the General Election, "Very sorry called away to constituency before all the arrangements for your inquiry completed," and he went so far as to ask what reparation would satisfy her for the way she had been treated. Proceeding, the noble lord said Miss Pennant's case had been submitted to a committee composed of both Houses of Parliament, and they unanimously came to the conclusion that she had made out a *prima facie* case which justified an inquiry being held. A grave injustice had been inflicted on Miss Pennant and an inquiry should be granted.

Lord BERESFORD supported the motion for an inquiry. He agreed that it would be fatal if that House or any other House tried to assert that the authorities had not the right to discharge and appoint. His own case was very similar. He did not agree with the Admiralty at all when he was Commander-in-Chief, and told them that they did not understand about the war, and they hauled down his flag and put him on the beach. (Laughter.) The fact that he was right and they were wrong had nothing to do with the case, because the authorities must have the right to appoint and discharge officials.

In his case he should have liked to get it, and after sitting three days a week for four months, that inquiry proved that he was correct. That inquiry did a great deal of good; and he got a great many things altered. Under the circumstances he supported the motion. There had been too much secrecy about this matter. (Hear, hear.)

Lord CLWYD said, seeing the public services Miss Pennant had performed in Wales and elsewhere and her character, the Government should be pressed to hold an inquiry.

The MARQUESS of LONDONDERRY, in reply, thought the controversy was based on an imperfect knowledge of the case. He repudiated every one of the accusations made in regard to concealment, deception, and corruption in this case. He was no desire whatsoever for any sort of concealment. The bare outline of the case was that this lady undertook a very difficult task and encountered immense difficulties, and as time went on it was decided to make a change. Many people who had been transferred or dismissed were labouring under a grievance, but was it suggested that they should all have a Judicial inquiry?

Lord BERESFORD: I suggest that they should if they demand it.

The MARQUESS of LONDONDERRY: That would mean a multitude of inquiries. Continuing, his lordship said that Lord Weir did not attempt to escape censure for the manner in which Miss Pennant was superseded. He (Lord Londonderry) admitted that Miss Pennant was not treated with the consideration to which she was entitled, but while that was a ground of grievance, it could not be said that it was a ground for inquiry. He had read all the correspondence and he had seen everybody whom he could see connected with the case, and he could not find any ground for the inquiry demanded.

With regard to Mr. Cecil Harmsworth's report, Mr. Harmsworth was at the time the Prime Minister's Private Secretary. His report was a private and confidential one, and it recommended that there should be a Judicial inquiry. But the Prime Minister, after reading what Lord Weir said, decided that it was not right or necessary to press the inquiry.

Mr. Harmsworth went down in a practically unofficial capacity and he interviewed a number of persons and obtained their opinions. These persons had not the slightest idea that what they told Mr. Harmsworth would be published for a White Paper to be laid on the table of both Houses of Parliament, and he (Lord Londonderry) felt that they would make it impossible for inquiries of this kind to be made if there was any possibility of the report being made public.

The Government were convinced that an inquiry of the kind suggested would be contrary to the interests of the public service. Miss Douglas-Pennant had stated that she had to contend with immense difficulties, and that there was a conspiracy to frustrate her efforts, and that small knots of people inside the Admiralty were in league to frustrate her work at the Air Ministry.

The Secretary of State satisfied himself that Miss Pennant—although he was quite aware of her other qualities—had not the qualities which were necessary to overcome those difficulties, and he had no alternative but to appoint someone else in her place. The proof that he took the right course was to be found in the fact that affairs began to mend from that moment, and he thought they could claim that the W.R.A.F. was now in an efficient condition.

He hoped the House would see that there was no case for a Judicial inquiry into the dismissal of a public servant who could not claim that efficiency in the department in which she was placed, and which had subsequently been managed in a satisfactory manner.

Lord BUCKMASTER said that the most cursory examination of the White Paper containing the correspondence would convince unprejudiced people that there was a serious matter in issue between Miss Pennant and the Air Ministry which could not be satisfied merely by an official answer, however candidly it might be given.

The EARL of DONOUGHMORE said in view of the charges contained in the papers circulated amongst their lordships, he was going to vote for an inquiry. He wished it to be understood that in voting for the motion he was only voting for an inquiry. He was not at all sure that Miss Pennant would get all the benefit from the inquiry that she expected.

THE HOUSE OF COMMONS.

The following oral answers were given on May 26th:—

ROYAL AIR FORCE.—LEAVE FOR INDIAN DRAFTS.

Sir HERBERT NIELD asked the Under Secretary of State to the Air Ministry whether he was aware that Leading Air-Mechanic Daniel Mahoney, No. 62750, late 49th Squadron, Royal Air Force, who had served twenty months in France, was ordered to leave Belgium for India at two hours' notice, which did not allow him time to send his personal belongings home, why it was that this soldier was not granted leave; whether he will see that steps are taken in the future to ensure that soldiers have an opportunity of seeing their relatives before being dispatched to India and like places at a great distance from home; and whether he will give facilities for Mahoney to return at an early date and, in the meantime, see that steps are taken to prevent the practice complained of being continued.

General SEELY: This airman is serving on an ordinary long-service engagement with the Colours. The departure of the Squadron to which he was posted was too near at hand to make it possible to grant him home leave. Home leave is given before men are sent to distant stations providing the exigencies of the Service permit, and it is regretted that the urgency of the departure of this Squadron to India made it impossible to follow this general rule on this occasion.

TIMBER COMMITTEE.

Mr. REMER asked the Under Secretary of State to the Air Ministry whether he was aware that one of the co-opted members of his Timber Committee was the official responsible for sanctioning the use of cypress on aeroplanes; whether he was aware that not more than two members of the Committee had any practical experience of sawing or converting timber; whether he will state the date that this Committee was appointed; and whether he will invite the National Federation of Sawmill Proprietors to nominate additional representatives to assist him in this important work.

General SEELY: I cannot accept the suggestion contained in the first part of the question. The decision was one arrived at by the responsible Technical Department on consideration of all the factors involved, one of which was the prospect of a future failure of supplies of better tried types of wood. The Timber Sub-Committee of the Conjoint Board was appointed on October 10th, 1917. Its composition is, I think, adequately representative for its purposes, but I will communicate the suggestion in the last paragraph of my hon. friend's question to the Conjoint Board.

AIR NAVIGATION.—CONVENTION APPROVED.

Mr. G. MURRAY (*by Private Notice*) asked the Under Secretary of State for Air whether the Convention relating to Air Navigation has yet been agreed to by the Allied and Associated Powers, and, if so, whether he will lay such document upon the Table of the House.

General SEELY: Yes, Sir; I am glad to be able to tell the House that on Thursday last, in Paris, the Aeronautical Commission held its final meeting, and agreed to a Convention relating to Air Navigation. On this Commission the five principal Powers are represented, as also Belgium, Brazil, Greece, Portugal, Roumania and Serbia. The seven smaller Powers enumerated have been appointed by the Supreme Council to represent on the Aeronautical Commission all the smaller Powers at the Peace Conference.

The Commission will agree upon a covering Report to be submitted to the Supreme Council. A few reservations by the Delegates of some of these States will be included in this Report. I do not expect that those reservations will affect the usefulness of the Convention. The document is of fifty-six pages, embodying general principles, nationality of aircraft, certificates of air-worthiness and competency, and many other matters of great importance to air navigation. It is of great interest, and I hope to lay it on the Table on an early day.

* * *

The following oral answers were given on May 27th:—

ROYAL AIR FORCE.—MOTOR CARS.

Lieut.-Col. W. GUINNESS asked the Under Secretary of State to the Air Ministry how many motor-cars are allotted to the civilian officials of the Air Ministry.

The UNDER SECRETARY of STATE for AIR (Major-Gen. Seely): Six.

Lieut.-Col. GUINNESS: Do the Regulations allow these cars to convey officials to and from their residences or do they come by bus?

Major-Gen. SEELY: I think they are permitted to convey the officials from their residences. I hasten to say that I think it very reasonable that they should.

Lieut.-Col. GUINNESS: Is the right hon. gentleman aware that the Leader of the House said yesterday that Regulations were issued limiting cars strictly to official business?

Major-Gen. SEELY: Yes, and I regard it as official business for these Civil officials to go to their residences or come from them to their offices. If a different policy is laid down, we shall conform to it, but I say at once on behalf of those to whom the cars are allotted, that I think it would be a mistaken policy to force these people, who are giving their services to the State, very often free, to go to the expense of hiring cars.

Mr. HOGGE: Is the right hon. gentleman aware that every Member of this House gives a large amount of time and money to the State and comes to the House and goes from it at his own expense? Does he really ask the House seriously to believe that people employed at the Air Ministry have a right to use public cars at the public expense to take them to and from their residences to their work?

Major-Gen. SEELY: I am not speaking of myself, naturally enough—my present office costs me a great deal of money—but I am speaking for the other officials, and under present circumstances where the difficulty is to find time enough to get the work done where millions of money are involved the officials to whom I refer, who cannot find the time to get the work done as that is, it would be a reactionary step to force them to hire cars for themselves. It is difficult enough to get the work done as it is.

Sir F. FLANNERY: Is my right hon friend aware that the Magasin de Louvre and other large business concerns have established a system

of conveying their employees from their residences in the morning, and that they do that as a matter of business economy in order to save the time of the employees?

AIR MINISTRY (ACCOMMODATION)

Major BOYD-CARPENTER asked the Under Secretary to the Air Ministry what was the present amount paid for No. 4 Thurloe Place; what is the amount of ground rent for these premises; with whom the rent had been arranged; and who was the owner at the time of the arrangement

Major-Gen. SEELY: The rate of compensation paid for the occupation of 4, Thurloe Place, is £2,530 per annum. The ground rent is £2,295. The rate of compensation was settled by the Defence of the Realm Losses Commission, the legal owner at the time of the arrangement being a Controller appointed by the Board of Trade to wind up the business of the Continental Tyre Company, Limited.

Major BOYD-CARPENTER asked what was the number of officers comprising the staff known as the South-Eastern area; what necessity there was in accommodating them in such premises as No. 4, Thurloe Place; whether they could not be accommodated at Kenley or Hounslow in huts, thus saving public money; and whether any attempt was made to so accommodate them.

Major-Gen. SEELY: The present number of officers engaged at Thurloe Place is eighty-one, the number of other ranks and of clerical staff being 288. The possibility of these headquarters being located out of London was fully considered, but it was decided that the administrative disadvantages which would follow were too great to allow that course being adopted. A large amount of public money had been saved by the move from Covent Garden Hotel, etc., to Thurloe Place.

Major LANE-FOX: Why is it necessary that the Air Force should take larger premises than they occupied before?

Major-Gen. SEELY: I am advised that that is not the case. There are fewer persons employed, and the total premises now occupied are smaller than those occupied before.

Major LANE-FOX: Is the right hon. gentleman aware that in answer to a question which I asked, I was told that the premises—the number of square feet—were considerably larger than the other premises?

Major-Gen. SEELY: I think not. They would be larger than the Covent Garden Hotel, but there were other places occupied by the same organisation now at Thurloe Place.

Sir H. DALZIEL: Can the right hon. gentleman say how many rooms were occupied at the Covent Garden Hotel?

Major-Gen. SEELY: It was before my time, but I will find out.

Sir H. DALZIEL: About a dozen.

Major BOYD-CARPENTER asked the Under Secretary to the Air Ministry if he was aware that when the tender for the purchase of 4, Thurloe Place was submitted it contained a specific statement as to the requirements for which it was being purchased and that, under Government authority, the tender was accepted without any objection as to these requirements.

Mr BRIDGEMAN: I have been asked to reply. I am informed that when the tender for the purchase of Nos. 1 to 4, Thurloe Place was submitted, a statement was made that the property might possibly be utilised for the purpose of letting flats. As the conditions under which the premises were then occupied were known to the would-be purchaser, the tender was accepted without any objection as to these requirements.

Sir R. COOPER: Is it not very unjust for the Government to allow a sale like this to go through, knowing the precise conditions under which it was being purchased, and then when it was completed to turn round and take the premises out of the hands of the purchaser?

Mr. BRIDGEMAN: The purchaser knew the conditions?

Sir R. COOPER: So did the Government.

Major LANE-FOX: Is it not a fact that the owner of the premises stated that before the premises were taken for this purpose notification would be sent, and that no notification was sent?

Mr. BRIDGEMAN: I cannot answer that offhand. I will try to find out, if the hon. gentleman will tell me who it was that promised to give notification.

Major LANE-FOX: It was an official of the hon. gentleman's Department.

YATE (GLOUCESTERSHIRE) AERODROME.

Mr. RENDALL asked the Under Secretary to the Air Ministry whether he was aware that many girls and women who volunteered for work at the Yate (Glos.) aerodrome have been recently discharged and their places taken by other women; whether this action is locally regarded as unjust and results in the turned-off women receiving out-of-work donation; whether, as the result of newspaper correspondence, no women received fresh notices on Friday, May 16th, but many girls left that week owing to previous notices and eight or nine fresh ones were taken on; and will he say what justification there is for this conduct.

Major-Gen. SEELY: I have not yet had time to obtain full information on this matter, and should be obliged if my hon. friend would postpone his question till Thursday.

OVERSEA FLIGHTS.

Sir A. FELL asked the Under Secretary to the Air Ministry if he will consider the question of the Government forbidding the flight of aeroplanes over wide stretches of sea until the aeroplanes have proved that they are capable of making non-stop flights over land of equal length with reasonable certainty.

Major-Gen. SEELY: I would refer to my statement in answer to a question on the same lines raised by the hon. and gallant Member for Larark in the course of the Debate on the Adjournment on the 20th instant.

* * *

The following written answer was given on May 27th:—

ROYAL AIR FORCE.—HALTON CAMP (WAGES).

Capt. BOWYER asked the Parliamentary Secretary to the Ministry of Munitions whether the men working on the contract at Halton Camp, Bucks, are receiving an exhorbitant rate of wages; whether, owing to lack of competent supervision, a minimum of work is being done for these wages; whether he was aware that as a result local labour is being demoralised by the sight of little work and high wages and is being attracted to Halton; and whether he will set up an inquiry into this matter, in view of the fact that local employers find it impossible to compete with the high wages at present ruling.

Major-Gen. SEELY: The rates of wages paid at Halton Camp are in accordance with Award No. 2197 of the Committee of Production, a copy of which I am sending to my hon. and gallant friend. I visited the camp ten days ago, and action has already been taken in order to ensure that there shall be no undue delay in carrying out the work, which urgently requires completion

The following oral answers were given on May 28th:—

INDIA.—BOMBING BY AEROPLANES.

Colonel WEDGWOOD asked the Secretary of State for India whether aeroplanes were employed to drop bombs on Indian rioters; if so, where, and by whose orders; and whether, in view of the difficulty of hitting any target with such bombs, he will issue directions that such weapons are not to be used in future against civilian populations.

The SECRETARY of STATE for INDIA (Mr. Montagu): Aeroplanes were used at Gujranwala in the Punjab as a measure of military necessity. They were dispatched from Lahore by the military authorities, and one plane dropped a few bombs on a mob which had since early morning been occupied in destroying houses in the civil station, the railway station and church, while women and children had taken refuge in the Treasury, protected only by a small force of police.

Colonel WEDGWOOD: Have instructions been given that aeroplanes are not to be used in future against the civilian population?

Mr. MONTAGU: No, Sir; the responsibility for carrying out martial law must rest with those who have to administer it. And if this is a question of dispersing a mob which is threatening the lives of women and children who are insufficiently guarded I refuse to interfere with the discretion of the military authorities

Colonel WEDGWOOD: In view of the fact that these aeroplanes cannot drop bombs accurately, and that therefore in large towns bombs are about certain to hit the wrong people, would it not be more humane to employ the other efficient means of defence in our power?

Mr. MONTAGU: Certainly in this case the aeroplane was successful in dispersing the mob. I am not sufficient of an expert to endorse the hon. and gallant gentleman's remarks about aeroplanes, but I would observe that there is all the difference in the world between aeroplanes flying at low altitude and those flying at a high altitude in order to avoid guns.

Colonel WEDGWOOD: How many people were killed?

Hon. MEMBERS: Order, order!

Colonel WEDGWOOD: I am always in order. How many people were killed, now many of these were non-rioters?

Mr. MONTAGU: I hope eventually to have the information necessary to inform the House about all these occurrences

ROYAL NAVY.—TRANS-ATLANTIC FLIGHT.

Lieut.-Col. W. GUINNESS asked the First Lord of the Admiralty if he would state what would have been the cost per month of keeping a line of ships stretched at intervals of fifty miles across the Atlantic while awaiting favourable weather for the trans-Atlantic flight.

Dr. MACNAMARA: I really do not think that any good purpose would be served by endeavouring to work out this cost, though, of course, it would be considerable. Neither do I think it is primarily a question of cost at all. The real question is what is the proper function of the Navy, and how far it is desirable and possible to add to its duties by obligations such as those indicated in my hon. and gallant friend's question. On that, as has been said more than once, the present commitments of the Navy are heavy and responsible. They cannot under any circumstances be set aside; and its resources leave no margin whatever for undertaking duties such as those referred to in the question.

Lieut.-Col. GUINNESS: As a matter of expert opinion, would it be possible to keep the Navy strung out in this way for an indefinite period, such as would have been necessary if public clamour had been satisfied?

Dr. MACNAMARA: I have already said it would be very expensive, but as it cannot be done the question of cost does not arise

Lieut.-Col. GUINNESS: It cannot be done?

Dr. MACNAMARA: No.

Lieut.-Col. Sir J. NORTON GRIFFITHS: Would it be possible, in the event of such flights taking place, if Admiralty ships were in the vicinity of the flight, that they should be notified that the flight is taking place so that they may keep a look out?

Dr. MACNAMARA: If they are there, yes—but they are always on the look out! I will put the point of notification to naval authorities.

Sir J. NORTON GRIFFITHS: Will the vessels be notified?

Dr. MACNAMARA: I will put the suggestion at once to the naval authorities.

Commdr. BELLAIRS: Would it not be quite possible to have fully-manned ships stationed on the West Coast of Ireland instead of two half-manned destroyers stationed at Queenstown?

Dr. MACNAMARA: It is a question of personnel, and the numbers in the Fleet. Many demands have been made for demobilisation as my hon. and gallant friend knows.

Commdr. BELLAIRS: Can you send the ships out?

Dr. MACNAMARA: My hon. and gallant friends request shall be put to the authorities.

* * *

The following oral answer was given on May 29th:—

CASUALTIES.

Mr. CLOUGH asked how many casualties there have been in the Air Force since the Armistice up to the present time, mentioning in addition those which have had a fatal termination.

Major-Gen. SEELY: The reply is as follows:—Officers, fatal, 374 up to May 25th, 1918, for Home and Overseas; other ranks, fatal, 848. The above figures are up to April 30th, as it was not possible to work out the information up to a later date in the time available The figures for non-fatal casualties up to date are being inquired into

* * *

The following is from the "Times" of June 3rd:—

Capt. WEDGWOOD BENN asked the Under Secretary for Air whether he could make a statement about the future organisation of the lighter-than-air branch of the Air Service.

Major-Gen. SEELY (Under Secretary for Air): Proposals to transfer the responsibility for airship construction from the Admiralty to the Air Ministry are now under discussion between the two Departments. I think it would be inadvisable to make any further announcement at present, but I will do so as soon as details have been arranged.

Major-Gen. SEELY, in reply to a question by Captain Ormsby-Gore, said that the Tarrant triplane was built for military purposes to the order of the Government, and it would not be in the interest of the public service for the results of a technical investigation into the causes of the accident which recently took place at Farnborough to be published.

AERONAUTICS and The LAW

THE USQUE AD COELUM DOCTRINE "WARNED OFF."

By "THE LINCOLN IMP."

Mr. Bickmore in a learned and interesting letter (see THE AEROPLANE for May 7th) comes to grips with the Imp on the *usque ad cœlum* doctrine. A technical letter calls for a technical reply which cannot but appear dull and forensic to a non-technical reader. Let such an one, therefore, be warned and desist.

ON CABBAGES AND KINGS.

By way of clearing decks for action, the Imp finds he can jettison a large portion of Mr. Bickmore's letter. To wit, that portion which deals with the sovereign rights of the State. Mr. Bickmore's views on this topic were anticipated by the Imp in his first article, "Trespassers, Beware!" In that article and in Mr. Bickmore's letter a distinction is drawn between cabbages ("to fly over his cabbage-patch" and kings "sovereign rights *usque ad cœlum*"). In spite of Mr. Bickmore and the Walrus, the Imp is of opinion that the time has not yet come to speak of the latter, and he intends for the present to confine himself to the topic of the private rights of private owners *usque ad cœlum*.

UNCHALLENGED AUTHORITIES.

The Imp in "Goshawks" traced the Latin tag, "Cujus est solum ejus est usque ad cœlum," to Coke upon Littleton as its origin. Coke there stated as a fact that this Latin tag had been "holden," *i.e.* decided, in three old cases, the reference to which in the year-books he gives. The Imp next proved that these three cases did not decide anything of the sort. Mr. Bickmore makes no attempt to challenge the Imp on any of these points.

Next, the Imp quoted more modern authorities, in which Lord Ellenborough and Lord Brampton had expressly denied that "interference with the column of air superincumbent on the close" or "firing in vacuo" was a trespass. These cases are passed over by Mr. Bickmore in silence.

SOME CONTRADICTORY CASES.

The line which Mr. Bickmore does adopt is that of adducing two other authorities which have the appearance, as he states them, of contradicting the cases on which the Imp placed reliance. These two cases, however, will repay a closer examination than Mr. Bickmore has given them.

HORIZONTAL HEREDITAMENTS.

The Eastcheap-Philpot Lane case is Corbett v. Hill, a well-known authority dealing with what are called "horizontal hereditaments." This action, as Mr. Bickmore says, was based on trespass, and an injunction was claimed—but then it was refused, which takes the sting out of the tail!

It is material to understand the peculiar facts of the case. Corbett had once owned the two houses, Nos. 15 and 34. He conveyed No. 34 to Hill, who pulled it down, and in so doing disclosed a first-floor room of No. 15 which had projected beyond the ground site into No. 34. Hill proposed to rebuild No. 34 over this first-floor room as the old house had been built. Corbett said, "No. The air over my room is mine, and you will be a trespasser if you build there."

The decision in the case was that Hill might build as he intended, and would not be a trespasser. It is material to notice (a) that it was expressly *not* decided that the projecting first-floor room belonged to Hill, the owner of the *solum* or site, and (b) that the air-space in question had already been occupied by bricks and mortar.

The decision really was that the upper storeys of No. 34 had been conveyed by Corbett to Hill and their removal did not prevent Hill from building in the air-space which they had occupied. It is true that the Court prefaced its order by declaring its opinion that the column of air over the projecting room passed by the conveyance of the ground site, but there was no reference made to *usque ad cœlum*, which is the portion of the tag which is obstructive to reasonable flying.

LEGAL PRESUMPTION.

The Imp must concede to Mr. Bickmore that the observations made by the K.C. went beyond what was necessary for the decision of the case: "Now the ordinary rule of law is that whoever has got the *solum*—whoever has the site—is the owner of everything up to the sky and down to the centre of the earth." But then he went on: "But that ordinary presumption of law, no doubt, is frequently rebutted by the fact that other adjoining tenements protrude themselves over the site." The phrase which the K.C. used—viz., presumption of law—gives a clue to the real origin and meaning of the maxim, a meaning which renders it no obstruction at all to the development of flying.

In strictness it is a rule of evidence and not a proposition of substantive law. There are precisely analogous presumptions of law that a conveyance of land adjoining a road passes the property in the soil of the road *usque ad medium viæ*, and that a conveyance of land adjoining a river passes the property in its bed *usque ad medium filum aquæ*. "It is a law of conveyancing that *prima facie* where a man grants land on the bank of a river, having himself the soil *ad medium filum*, the soil *ad medium filum* passes by the grant."

Paraphrasing these words of Kay, J., in Tilbury-v. Silva, we may say: "It is a law of conveyancing that *prima facie* where a man grants land, having himself the air-space above it, the air-space, as far as he has it, even *usque ad cœlum* passes by the grant."

Unfortunately the qualifying words, being of little or no importance until flying was invented, have dropped out of the rule as commonly stated. The rule could not, however, be more neatly or accurately put than by the late Lord Chancellor in a very recent case: "The word 'soil' is apt to denote the surface and everything above and below it."

CONSTELLATIONS OR CEILING?

The rule is a rule of conveyancing, and lays down what is included in such words as "terra," "solum," or "land" in the parcels. It has nothing to say to the question, "Can a private individual own a bit of heaven or hell?"

It answers this question thus: "*If* he can, he can convey it to another by using the word 'land,' and will be taken to have done so in the absence of some reason to the contrary." Possession and ownership of the sky is a question of fact, in the ultimate analysis, which up to the present and even now must be answered

in the negative. After all, what is this *cœlum?* Is it that which Addison has so finely said :

"The starry firmament on high,
And all the blue ætherial sky,"

or is the *cœlum* what constructors and pilots call "the ceiling" of an aeroplane? That is the highest attainable point.

THE TUNNEL CASE.

We must hasten to the second of Mr. Bickmore's authorities. The tunnel case does not give him all the support he seeks to draw from it. True it is that *it was said* there that ownership of the surface gives ownership of everything above the surface *usque ad cœlum* and of everything below. But by whom was it said? By counsel in arguing, and not by the judge in his judgment.

The judge thought it sufficient to say that "so much of what is beneath as is necessary for the enjoyment of the surface" was the depth to which the rights of the surface owners went. This qualified statement of the doctrine is very reminiscent of the judgment of Brook, J., in the Bishop of London's case, where the claim made by counsel went *jusqu'al firmament.* The judge carefully qualified his judgment thus : "And so all the earth in which it grows in depth and all the air which nourishes it in height belongs to him to whom the tree belongs." Even Mr. Bickmore in his letter applies the same test : "Ownership *and possession* [Imp's italics] of the superincumbent space lying above the site is essential to the full enjoyment of the site or surface of the earth itself." Does Mr. Bickmore already *possess* a mansion in the skies? Does he find its possession essential to the enjoyment of his home on the earth?

A TRESPASSER WHO COMMITS NO NUISANCE.

Mr. Bickmore also cites some old cases of nuisance and some distinctions which have been drawn between air-space and currents of air. His remarks on these topics were worth writing in this connection, and well repay reading, but the Imp is not called on to answer them because they are not relevant to the sole topic the Imp is here discussing—whether flying involves trespassing. An aeroplane at 20,000 feet commits no nuisance to the cabbage-patch of an allotment-holder, but is it trespassing on his property? As the law stands, Mr. Bickmore thinks it is. The Imp begs to differ.

THE INQUEST ON CAPTAIN RAWLINGS.

Mr. J. T. Coggins, deputy coroner for Aldershot, opened the inquiry at the Cambridge Hospital, Aldershot, on May 28th, into the death of Captain Percy T. Rawlings, D.S.C., D.F.C., R.A.F., late R.N.A.S., who died from injuries received in the accident which took place during the trial of the Tarrant triplane at Farnborough Aerodrome, on May 26th. Capt. Rawlings was general manager of the Aircraft Department of Tarrants, Ltd. The machine had been built and prepared for its trial flight under the personal direction of Mr. W. G. Tarrant, the designer and constructor.

Mr. C. W. M. Price represented Mr. Tarrant, who was also present. Mr. Walter Frampton appeared for Messrs. Ogilvie and Partners, aeronautical engineers.

The Coroner told the jury that he had summoned them, as the inquiry was a matter of public interest.

The Coroner added that an inquiry was being made into the disaster, but the report of the experts had not yet been issued, and, in order to give the experts an opportunity of making their report, and also particularly to give Mr. Tarrant an opportunity of calling a witness who was injured in the smash, he proposed to adjourn the inquiry for a fortnight, after taking evidence of identification.

Mr. Price suggested an adjournment of three weeks, and the Coroner agreed.

The foreman of the jury expressed regret at the accident, and sympathy with the relatives.

The Coroner concurred.

Mr. Tarrant : I should like to express my very great sorrow and sympathy with the relatives on this occasion, and to say how very much I appreciated the efforts of Captain Rawlings in assisting in the construction of this machine. He was quite as keen on the machine as I was. Nothing I can say can sufficiently express all that he has done.

Mr. W. Brook-Sayers, Colonel Ogilvie, and the Superintendent of the Royal Aircraft Establishment associated themselves with the expression of sympathy.

The inquiry was then adjourned until June 18th.

AN ACCIDENT IN ITALY.

On May 18th Lieut. Prince, R.A.F., and Lieut S. Spratt, R.A.F., were killed in an aeroplane accident at Centocelle aerodrome, Italy. Colonel Lawrence, R.A.F., another occupant of the machine, a Handley Page, was injured and two mechanics were hurt, but not seriously. The accident was caused through a bad landing owing to the dusk. This machine, in company with another, had left Marseilles that morning, making a short stay at Pisa, and it is stated that no warning of their departure from Pisa was given. The second machine landed in safely. King Victor Emmanuel paid a visit to the injured men in hospital.

THE R.A.F. AND RABIES.

The official at the Board of Agriculture who is mainly responsible for the administration of the Rabies Order stated on May 31st that information recently obtained satisfied the Board that many officers of the Royal Air Force were flagrantly disregarding orders and were smuggling dogs into this country from France and Belgium.

It should not be possible for any dog to be brought into a camp without the knowledge of the officer commanding, and he had no doubt some responsible officers knew what was going on. This official suggested that if offenders were promptly dealt with by court-martial it would probably have a salutary effect. Many offenders who were just about to be demobilised did not mind the risk of being caught; but a smart sentence, carrying with it the loss of gratuity, would probably stop these reprehensible practices.



The arrival on May 31st of N.C.4 at the Cattewater R.N. Air Station after the successful flight from Lisbon.

THE TRANS-ATLANTIC COMPETITION.

On May 28th, Mr. Hawker and Lieut.-Commander Mackenzie-Grieve were received in audience by H.M. the King, who decorated them with the Air Force Cross. Later they were introduced to the Queen and the Prince of Wales.

The "Lake Charleville," an American steamer, picked up, on May 23rd, the Sopwith aeroplane abandoned by Mr. Hawker. The position of discovery was latitude 49.40 N. and longitude 29.08 W. The mails on board were recovered.

The American Attempt.

The N.C.4, under the command of Lieut.-Commander Read, U.S.A., left Ponta Delgada at 10.18 a.m. (G.M.T.) on May 27th and reached Lisbon on the same day at 8.4 p.m. (G.M.T.).

On May 30th the N.C. 4 left Lisbon at 5.20 a.m. for Plymouth. Owing to adverse winds, she was forced to alight in the Mardego river. Rising later, she was flown to Ferrol, alighting there at 4.35 p.m. (G.M.T.).

At 6.27 a.m. (G.M.T.), on the following day, the N.C.4 left Ferrol for Plymouth. The weather was squally, with fairly thick cloud. Only the destroyers were sighted. Brest was reached at 11 a.m. (G.M.T.), but the seaplane did not alight. After circling over the harbour she was flown direct to Plymouth, passing frequently through heavy rain. The wind was adverse, and progress was slow. Plymouth was sighted at 1.12 p.m. (G.M.T.), and the machine alighted at 1.30 p.m. (G.M.T.)

Three British flying-boats (F.2a type), under Major R. K. Kershaw, escorted the American boat into harbour.

The following table gives the various stages of the flight.

	Miles.	Time hrs.	min.
May 8th-10th.			
Rockaway to Trepassey	950	—	—
May 16th.			
Trepassey Bay to Horta	1381	15	18
May 20th.			
Horta to Ponta Delgada	169	1	45
May 27th.			
Ponta Delgada to Lisbon	925	9	44
May 30th-31st.			
Lisbon to Plymouth	895	10	20

Lieut.-Commander Read, who landed at 4 p.m. at the Barbican, at the point from which the crew of the "Mayflower" left for their historic voyage to America, was received by the Mayor and the local Naval, Military, and R.A.F. staffs, as well as by the crews of N.C.1 and 3. Lieut.-Commander Read proceeded to London on Saturday last, where he also had a reception which proves that we are, as a race, not ungenerous to foreigners.

Another Entrant?

It is rumoured that Miss Ruth Law, who has attained distinction as a pilot in America, intends to compete for the prize. She is said to have chosen a Curtiss flying-boat as the most suited to the conditions of the flight.

Other Competitors.

The Vickers and Handley Page biplanes are both rapidly nearing completion in Newfoundland.

Messrs. Boulton and Paul have selected Major K. S. Savory, D.S.O., R.A.F., and Captain Woolner to pilot the first of their two biplanes entered by the firm. Captain A. L. Howarth is to be observer and wireless expert.

The British Airships.

It is stated that an attempt will probably be made to fly the Atlantic some time next month by either the "R.33" or the "R.34," both of which are Admiralty airships.

A Consolation Prize.

Lieut.-Commander Grieve, A.F.C., and Mr. Harry Hawker, A.F.C., were the guests of honour at a luncheon given at the Savoy Hotel by the proprietors of the "Daily Mail" on May 28th. Major-Gen. the Right Hon. J. E. B. Seely, C.B., C.M.G., D.S.O., M.P., handed them a cheque for £5,000 given by the "Daily Mail" as a consolation prize.

The majority of the speeches were up to the average standard of mediocrity, but Mr. Hawker said modest and effective words that pleased the gathering.

He began by thanking everyone for taking so much notice of "our feeble effort." There was hearty laughter when he went on to say, with evident sincerity, that there was not a man present who would not have done the same thing

The position, he pointed out, was simply this, that owing to the long delay people on the other side began to think there must be some reason why they did not start. It even went so far as statements in the papers that as soon as the Americans got to the other side Hawker and Grieve would pack up and go home.

"I don't think they knew us," he said. "We had decided the night before the start that if we didn't go to England we would go to the Azores, and on to Portugal, because, you see, there was an easterly gale which at that time made it impossible to reach England. But the weather improved. It was very unfortunate for Raynham that he couldn't get off with an east wind, and very fortunate for us that we could."

Lieut.-Commander Mackenzie-Grieve confessed that at one time he had been a bit frightened about the navigation of the aeroplane. On leaving St. John's he had no idea how things would pan out, but he said to himself: "Here's the sea. We must navigate her as we do a ship at sea, and we must regard the clouds as our horizon—with certain technical differences, of course."

The Royal Aero Club's Tribute.

Lieut.-Commander Grieve and Mr. Hawker were entertained to lunch by the Royal Aero Club at the Savoy on May 30th. Brig.-General Sir Capel Holden, the Chairman, proposed the health of the heroes of the day, and explained that this was not a formal reception but purely a family gathering of the members of the Club to welcome the return of one of their members and his companion in danger. Mr. T. Marlowe, of the "Daily Mail," supported the toast.

Lieut.-Colonel Frank McClean, who was described by the Chairman as the father of British Naval Aviation, also supported the proposal. He was received on rising with almost adequate applause, and said, after a brief tribute to Mr. Hawker's pluck in starting despite adverse conditions, that Lieutenant-Commander Grieve's navigation was one of the finest pieces of work of its kind ever done—a statement which was received in a manner which left no doubt as to the appreciation of the fact by the members of the Royal Aero Club.

Mr. Hawker and Commander Grieve returned thanks with the maximum efficiency, averaging about a dozen words each and sustaining their reputation for being "men of deeds, not of words."

Mr. T. O. M. Sopwith also replied to the toast, and gave some interesting details of the flight which had not been published. He said that when he found that the engine was overheating, Mr. Hawker brought the machine down from above the clouds somewhere over 10,000 feet to under 1,000 feet before he found clear air. Being below the clouds Commander Grieve's job as navigator ceased, and he promptly went to sleep. Some hours afterwards he woke up and casually inquired whether Mr. Hawker had found a ship yet. As Mr. Sopwith remarked, "you can't beat a man like that."

Another interesting fact disclosed by Mr. Sopwith was that one of the first things which the pair asked after he had met them at Grantham was that they should be allowed to have another shot at the trans-Atlantic flight. He then announced that the firm did not intend to try again, as it had had its chance, but that he wished all the other competitors better luck than they had had. Mr. Sopwith finished by tendering the congratulations of all present to the Americans who had succeeded in crossing the Atlantic by air, a sentiment which was loudly applauded.

Major-General Sir Sefton Brancker, K.C.B., proposed the health of the Chairman with a brevity only matched by the speeches of the guests of the day.

The Sopwith at Selfridge's.

On June 2nd and for some few days to come the remains of the Sopwith aeroplane flown by Mr. Hawker on his attempt on the Atlantic flight may be seen by those sufficiently interested on the roof of Selfridge's, Oxford Street, W.1. There is no charge for admission.

Atlantic Weather.

The following is taken from the "Times" on June 3rd:—

Sir,—It may be of interest to mention that in 1857, previous to the laying of the first Atlantic submarine cable, I was on the staff of that company under its engineer, Mr. (afterwards Sir Charles) Bright, and I had the duty of making an analysis of the weather in the North Atlantic from the logs of the Cunard Royal mail ships—Liverpool to Halifax and Boston—for the years 1854-55 and 1856, for the months of June, July, and August, to find the time most favourable in atmospheric, sea, and ice conditions for laying the cable.

I remember about the first week in July to the first week in August was decided upon as being the most suitable, and my subsequent experiences in 1865-66 and 1869 in laying those Atlantic cables with Sir Samuel Canning confirmed that time. It is true you are always liable to a summer gale, but not often to real bad weather. This information may interest your readers and the flying world whom we all so much admire.—Yours obediently, JOHN TEMPLE, C.B.

Aigburth, Liverpool, June 2nd.

Mr. Prodger's Trans-Atlantic Attempt.

Mr. Clifford B. Prodger states that though he endeavours to make a trans-Atlantic flight he is unable to state definitely the type of machine in which he will make the attempt.

Pilots for the Fairey Seaplane

The Fairey Aviation Company, of Hayes, Middlesex, announce that they do not require more pilots for the trans-Atlantic Flight. Those who have applied but have not yet had a reply will receive one in due course.

A HISTORY OF THE R.N.A.S.

Sir,—I believe that I express the sentiments of all former officers and men of the late Royal Naval Air Service when I make the suggestion that a concise and complete history and record of the work of the Royal Naval Air Service, published in book form, would fill a gap in our war records very desirably, and would be most warmly received by all former members of that Service.

There have been references quite frequently to the work or history of the R.N.A.S. in many of the popular books on the subject of war-flying in its many aspects. There have been letters published dealing with the life and work of aviators in this Service. There have been very condensed reports of the work of the Air Forces attached to Naval commands in many of the official War Office and Admiralty reports, some of which have been published, but many more filed away and unpublished.

Now that the war-time censorship has been removed, why should not a complete and collected account, compiled by a capable person who has access to all sources of records and references, be published as a memorial of an extinct Service, and as a history and record for the many men who are proud to have once belonged to such a select and distinguished Service? Such a book, I suggest, would be a worthy acquisition to the bookshelves reserved for war or aeronautical works, and would be in demand by the large number of members of the Flying Services.

May I take the liberty of offering the following general plan of such a work, as I should like to see it treated?

A Record of the Work of the Royal Naval Air Service.

I.—Instigation and Establishment of the R.N.A.S.

II.—Air Work in conjunction with the Fleets.

III.—Bombing Operations:—

1. North Sea and Belgium.
2. France, Germany, etc.
3. The Near, Middle and Far East.

IV.—Fighting Operations of the R.N.A.S. on the various Fronts.

V.—Anti-raid and anti-aircraft work in Britain.

VI.—Anti-submarine work.

VII.—Observation work (spotting, reconnaissance, balloons, airships, etc.)

VIII.—Conclusion—the transformation of the R.N.A.S.

Each chapter or section should take the form of a separate small history in itself, dealing with the development of machines and methods, the actual operations, and the splendid work and results of the more noteworthy of the Service heroes. The book will be really interesting, I believe, only as it is interspersed through every chapter with numerous cited incidents and adventures. Therein lies the popularity of the excellent record of "Submarine and Anti-submarine" work, by Henry Newbolt, and other similar books. To read of the achievements of our comrades, known or unknown, cannot fail to arouse in us a greater pride than ever in the Service to which many of us were once privileged to belong.

I am writing this in the belief that at the present time no book such as I suggest exists. If there is such a work, of which I am ignorant, I shall be very grateful indeed to learn of it.

I hope that this subject may be carefully considered and taken up in the interests of the Air Services, and particularly of the Royal Naval Air Service. In these times when history is being made day by day, we should have a careful record for the use of future generations whose business is to write the history of the past from the best records they can obtain. To our own generation, also, such a record should appeal very much. I should be glad if you would direct this letter to the attention of those best able to give it careful thought. I am not writing it merely for myself, but under the conviction that it is expressive of the desire of the whole Service, and that it is in the interests of that Service. Therefore, I trust that it will be accorded the attention that such a general desire merits.

Kenneth P. Kirkwood.
Lieut., R.A.F. (ex-R.N.A.S.)

AVIATION IN RUSSIA.

The following letter was published in the "Times" of May 26th:

Sir,—The war has been the means of bringing aviation to a high standard. The armies' and navies' enormous demands for the output of aeroplanes have greatly developed this branch of British industry. The present difficult lies in finding a solution of applying aviation to civil life. The latest efforts in endeavouring to cross the Atlantic and establish air communication with India unfortunately show that our hopes cannot as yet be realised of making aviation (in the near future) a serious and reliable competitor with other existing means of communication in this country.

I should, therefore, like to draw the attention of the British public to the one important solution which would most certainly support and develop this young branch of British industry, and at once render her practical and most useful. Russia, one of the greatest and flattest countries in the world, with any amount of natural landing ground, suitable climate for aviation as regards wind and fog, will be left practically without any means of communication at all.

The Bolshevists, whose downfall is now a matter of a few weeks, will be replaced by a staple and strong Government. But two years of civil war have entirely destroyed all railway traffic. The state of roads renders motoring almost an impossibility. River traffic is slow and out of the question during the winter months.

I therefore most emphatically state that Russia, in her present state, as well as in the near future, offers an unique opportunity for the immediate development of civil aviation without almost any sort of competition from other means of communication.

The development of air lines in Russia between various parts of the country would be of an enormous value to the future Government. It would help to reinstate order easier and quicker, and help Russia to attain a normal existence once again. Aviation would find a noble scope, and exist not only as a military weapon for destruction, but be the means of reconstructing a large country, which has for so long suffered at the hands of the evil genius of destruction.—P. Shishkoff (formerly Director of Aircraft Experiments, Russian Navy).

A SMITTEN CRITIC.

Sir,—May I be permitted to make a somewhat belated reply to your critic's remarks on my book, "Air Men o' War."

First, "R. H. B." strafes me severely for the title of my book, which he refers to as "*Airmen* o' War." May I point out that this is either a direct misrepresentation or such a casual reading as a critic may reasonably be ashamed of. The title printed on the cover, on the title page, the Dedication, and everywhere else is clearly and distinctly and intentionally "Air Men o' War." Your critic is the only person I have found object to the title, or fail, as he apparently does, to understand it. I might certainly have called it "Men o' War of the Air," or "Flying Officers, N.C.Os., and Men of War," or something else more intelligible to your critic's understanding, but I still prefer my own title. I have not seen "Airmen" flaunted in any review but The Aeroplane's, or on any bookstall. They reviewed and showed "Air Men——."

"R. H. B.'s" bitter objections apparently are based on the assumption that, as he puts it, "An 'airman' is one of those depressed-looking beings that carry deboshed petrol cans about, whistling curious dirges between their teeth. Something in armoured boots for preference," etc., etc.

I want to protest as vigorously as I can against this and other unpleasant and unfair running down of a class of men who, to my own knowledge, not only did their own job on the ground well, and in the 'dromes had to stand frequent and unpleasant doses of bombing and machine-gunning and long-range shells, but also from their ranks provided many pilots and observers and aerial gunners who flew as Officers, N.C.Os., and Men, earned decorations, and generally were a credit to the Force to which they belonged.

Is "R. H. B." aware of the fact that McCudden started as a mechanic, and was in no way ashamed of the fact, or does he despise Mac as a one-time "depressed-looking being," etc., etc. And I could string off a list of names of men who were "airmen" and also flying men that the R.A.F. was proud of.

Curiously enough, "R. H. B." singles out as "the best tale of the lot," a story which describes the work of some of those "depressed-looking," etc., and I might have hoped it would have given him some idea of part of the strenuous life of the men on the ground, and led him to leave out his insulting remarks on good men.

"R. H. B." kindly refuses "to harp on the occasional mishandling of technical minutiae," but he at least might have quoted me correctly and not mishandled my mishandling, as in the paragraph he holds up to scorn "jerking flashes of the machine-gun that blazed along her propeller." I wrote "through her propeller," which I think expresses my meaning, although I ought perhaps to have written "airscrew" and quoted the language of the C. C. Gear Handbook to avoid "mishandling."

"R. H. B." may be critic and judge enough of writing to entitle him to find fault with my style and my pages "thickly spangled with adjectives," but will he allow me to point out gently that the reproof, coming as it does on top of his sentence on the "depressed-looking beings," "deboshed petrol cans," "curious dirges," "armoured boots" sounds rather like "Satan reproving sin." I doubt if even I average four single- and double-barrelled adjectives to five consecutive nouns.

And even I in my worst "dazzle-writing" have not been guilty of his expression "Poilu of the Blue." "I say it very loud and clear," Mister R. H. B., even as you say about the depressed dirge whistlers, that "Poilu" is the French nickname for their unkempt, untidy—if I may borrow the witty adjective—"deboshed" infantry of the line, literally the bearded, the hairy ones. "R. H. B." may scorn my "Air Men" title, but I'm conceited enough to prefer it to "Poilu (Hairy Ones) of the Blue," or even "Intrepid Aviators" or "Birdmen."

(Signed) Boyd Cable.

NAVAL & MILITARY AERONAUTICS

FROM THE "LONDON GAZETTE."

ADMIRALTY, May 27th.

The King has been pleased to approve of the award of the following decorations to the undermentioned men :—

MERITORIOUS SERVICE MEDAL.

Air Mech (1st Cl.) F. Hainsworth, R.N.A.S.
C.P.O. (3rd Cl.) P. H. Brooks, R.N.A.S., O.N.F. 12795.

AIR MINISTRY, May 25th.

The following temp appointment is made at the Air Ministry :—
Director.—Lt.-Col. (actg. Brig.-Gen.) C. L. Courtney, C.B.E., D.S.O., and to retain the actg. rank of Brig.-Gen. while so empld., from March 1st to April 30th.

The following temp. appointments are made :—Staff Officer, 1st Cl.—(Air.)—Maj. H. A. R. Aubrey, O.B.E., M.C., May 1st.

Staff Officer, 2nd Cl.—(P.)—Capt. J. S. T. Bradley, on relinquishing the appointment of S.O., 1st Cl., vice Lt. H. J. G. Newman, M.B.E., May 31st.

FLYING BRANCH.—Majs. to be graded for purposes of pay and allowances at Lt.-Cols. (A.) :—T. O'B. Hubbard, M.C., A.F.C., while so empld., May 1st; C. F. Portal, D.S.O., M.C., while so empld., May 1st.

Maj. J. T. Babington, D.S.O., to be graded for purposes of pay and allowances as Lt.-Col. (A. and S.) while so empld., from May 1st to May 28th.

Maj. O. T. Boyd, M.C., to be actg. Lt.-Col. while so empld., from Jan 18th to April 30th.

Capts. to be graded for purposes of pay and allowances as Majs. while empld. as Majs. (A.) :—(Hon. Maj.) F. B. Binney, C. H. Darley, D.S.C., D.F.C., D. G. Donald, H. S. Kerby, D.S.C., A.F.C., L. L. MacLean, C. E. H. C. Macpherson, R. D. Oxland, W. R. Read, M.C., H. A. Smith, M.C., E. R. Vaisey, May 1st.

Capts. to be graded for purposes of pay and allowances as Majs. while empld. as Majs. (A. and S.) :—E. G. Hopcraft, D.S.C., F. J. Linnell, C. H. C. Smith, May 1st.

Capts. to be graded for purposes of pay and allowances as Majs. while empld. as Majs. :—G. G. Cooke, D.S.C. (A'ship), J. Wann (R.B.), May 1st.

Capt. (actg. Maj.) M. Le Blanc-Smith to be Capt. (A.), and relinquishes the actg. rank of Maj. on reduction to estbt., April 24th.

Capt. W. G. Pigott to be graded for purposes of pay and allowances as Capt. while empld. as Capt. (R.B.), from April 1st, 1918, to July, 8th, 1918.

To be actg. Capts. while empld. as Capts. (A.) :—Lt. (Hon. Capt.) H. B. Russell, from Nov. 1st, 1918, to April 30th; Sec. Lt. S. King-Smith, from (T.), from Dec. 13th, 1918, to April 30th.

Lts. to be graded for purposes of pay and allowances as Capt. while empld. as Capts. (A.) :—G. Andrews, H. M. Coombs, D.F.C., E. D. G. Galley, M.C., A.F.C., J. H. Jephson, A. G. Lamplugh, H. M. Moody, M.C., W. G. Preston, D.F.C., R. W. Reid, M.C., H. L. Rough, D.F.C., G. S. White, H. J. Whittingham, May 1st.

Lts. to be graded for purposes of pay and allowances as Capts. while empld. as Capts (A. and S.) :—W. R. Curtis, A. W. Fletcher, A.F.C., J. K. A. Jeakes, D.F.C., M. H. Rattray, May 1st.

Lt. T. A. Byers to be graded for purposes of pay and allowances as Capt. while empld. as Capt. (R.B.), May 1st.

Sec Lts. to be graded for purposes of pay and allowances as Capts. while emplds. as Capts. (O.) :—L. J. Chandler, D. G. Fleming, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Lts. while emplds. as Lts. (O.) :—J. Bowen, W. H. Dunton, T. O. Harvey, P. J. Hayes, A.F.C., K. C. McKenzie, A. Neeson, W. Smith, W. A. Thompson, H. J. White, May 1st.

Sec. Lts. to be Lts. :—(Hon. Lt.) A. B. Clark, M.C., April 6th, 1918; H. W. Kelly, May 19th, 1918; J. Hackett, Oct. 26th, 1918.

W. L. Hemus (temp. Capt., Worc R.) is granted a temp. commn. as Sec. Lt. (A.), Sept. 16th, 1918, and to be Hon. Capt.

Ft. Cmdt. G. J. Cross is granted a temp. commn. as Sec. Lt. (A.), Aug. 12th, 1918.

The following are granted temp. commns. as Sec. Lts. (O.) :—L. R. Griffin, M.M. (Sec. Lt., R. Berks R., T.F.), C. W. K. Hodges Sec. Lt., Norf. R., T.F.), Nov. 9th, 1918.

The following are granted temp. commns. as Sec. Lts. (K.B.) :—T. C. W. Haynes (L'pool R.), Spec. Res.), and to be Hon. Lt.; H. A. B. Brough (temp. Sec. Lt., M.G. Corps), S. V. Evans (Sec. Lt., Notts and Derby R., T.F.), H. H. Lockwood (Sec. Lt., W. Rid. R., T.F.), H. McA. Peacock (temp. Lt., R. Fus.), and to be Hon. Lt., Oct. 20th, 1918; A. T. T. Sleed (temp. Sec. Lt., Gen. List, S.A.), Nov. 10th, 1918.

The following relinquish their commns on ceasing to be emplds. :—Lt. (actg. Capt.) G. E. Wait (Capt., W. Ont. R.), Dec. 12th, 1918; Lt. A. L. Galbraith (Lt., C. Ont. R.), Dec. 18th, 1918; Lt. N. H. Raikes (Lt., Canadians), Jan. 1st, Sec. Lt. (Hon. Lt.) C. Frey, M.M. (Lt., Sask. R.), Jan. 9th; Lt. G. M. Morrison (Lt., New Bruns. R.), Jan. 14th; Lt. R. H. Kelly (Lt., Quebec R.), Feb. 3rd; Sec. Lt. (Hon. Lt.) J. L. Kennedy (Capt., Arg. and Suth. Highrs.), Feb. 20th; Lt. W. E. James, M.C. (Lt., Sask. R.), March 10th; Lt. M. R. Chidson (Lt., R.G.A.), March 24th; Lt. (Hon. Maj.) A. G. Lincoln (Maj., E. Ont. R.), March 31st; Sec. Lt. T. Clarkson (Liec. R.), April 4th; Sec. Lt. (Hon. Lt.) R. J. Weatherhill (C. Ont. R.), May 4th; Lt. (Hon. Capt.) R. F. Ward, M.C., D.F.C. (Capt., R. Welsh Fus.), May 7th; Lt. (actg. Capt.) C. P. Falkenburg, D.F.C. (Lt., Quebec R.), May 9th; Sec. Lt. A. Lewin, May 12th (substituted for notification in "Gazette," March 4th); Lt. G. D. Gillie, M.C. (Lt., E. Ont. R.), May 15th.

Transferred to unempld. list :—Lt. J. F. Alcock, Jan. 20th; Sec. Lt. R. Walker, Feb. 1st; Lt. H. D. Humphreys, Feb. 2nd; Lt. E. Wilson, Feb. 4th; Sec. Lt. F. Shaw, Sec. Lt. E. Smith, Capt. H. G. Watson, Feb. 7th; Sec. Lt. C. N. Yeoman, Feb. 20th; Lt. H. S. Welby, Feb. 25th; Sec. Lt. A. T. Veness, March 1st; Lt. M. L. Williams, March 3rd; Lt. M. L. Snelling, March 4th; Sec. Lt. F. H. Allan, Sec. Lt. T. H. Allan, Sec. Lt. P. C. Armstrong, Sec. Lt. F. C. Armstrong, Sec. Lt. F. C. Murray, March 7th; Lt. F. H. Chainey, Sec. Lt. C. Wilkinson, March 14th; Sec. Lt. R. H. Masterman, Sec. Lt. L. A. Willmore, March 15th; Lt. C. P. Shilton, March 24th; Capt. (actg. Maj.) A. M. Shook, D.S.O., D.S.C., Lt. T. P. W. Young, March 28th; Sec. Lt. H. C. Anderson, Sec. Lt. St. C. McG. Martin, March 31st; Sec. Lt. G. T. Beggs, Sec. Lt. F. H. Coprock, Sec. Lt. J. Elliott, Lt. W. G. Foster, Sec. Lt. T. C. Fraser, Sec. Lt. C. G. Grant, Lt. H. D. McKay, Sec. Lt. D. St. C. MacDonald, Sec. Lt. F. E. Place, April 1st; Lt. J. A. Fleming, April 2nd; Lt. R. A. Manly, April W. Young, March 28th; Sec. Lt. H. C. Anderson, Sec. Lt. C. McG. 3rd; Capt. D. D. Findlay, Sec. Lt. C. V. Forsyth, Lt. A. C. Wilson, April 5th; Maj. J. G. Swart, M.C., Sec. Lt. J. N. Schofield, April 8th; Lt. F. Duffy, Lt. D. T. Forbes, Sec. B. Solomons, Capt. G. F. Ward, April 9th; Lt. F. H. Hayns, Lt. G. A. Ogg (R. Highrs.), Sec. Lt. C. Skinner, Capt R. B. Wann, April 10th; Sec. Lt. C. D. Smith, Lt. E. A. Sullock, Sec. Lt. J. A. Senior, Sec. Lt. A. A. Swait, April 11th; Sec. Lt. R. M. Freshwater, Lt. W. W. Sharpe, Lt. W. B. Ward, D.F.C., April 12th; Sec. Lt. C. O. Carson, Capt. R. D. Delamere, D.S.C., Sec. Lt. (Hon. Lt.) F. Egerton, Lt. S. C. Foster, Sec. Lt. A. H. Freed, Sec. Lt. R. D. Poland (Rifle Bde.), Sec. Lt. E. D. Smith, Sec. Lt. W. E. Searle, Lt. E. G. Spooner, Sec. Lt. A. Smith, Lt. A. G. Tyrrell, April 13th, Capt. B. R. Millar, Sec. Lt. E. G. A. Peskett, Lt. G. Rooney (Royal Irish Fus.), Sec. Lt. E. M. Lt. D. H. Sadler, Lt. E. G. D. Shand, April 14th; Sec. Lt. L. Dickinson, Sutton, Sec. Lt. A. M. Smith, April 15th; Lt. W. E. De B. Diamond, Lt. W. S. Gregor, Sec. Lt. (Hon. Lt.) D. G. O. Hepworth, April 16th; Lt. C. H. Lee, Sec. Lt. N. M. Simpson, April 17th; Lt. G. A. Hayward, Sec. Lt. S. S. Saunders, Lt. L. Thomas, April 18th; Sec. Lt. A. M. Berry, Sec. Lt. J. L. Campbell, Sec. Lt. P. A. Clayson, Sec. Lt. W. Z. Cade, Sec. Lt. H. N. Eyre, Sec. Lt. J. B. Gunn, Sec. Lt. E. R. Moore, Sec. Lt. G. E. Meisenheimer, April 19th; Lt. G. S. Daniel, Sec. Lt. C. E. Francis, Lt. D. M. McBeath, Lt. E. J. Smith, April 20th; Sec. Lt. A. E. S. Gascoigne, Sec. Lt. A. T. Start, April 21st; Sec. Lt. P. D. Broughton, Lt. H. A. Reece, Lt. A. E. Spencer, Lt. A. E. Snelling, Capt. F. G Saunders, M.C., April 22nd; Sec. Lt. G. H. Alexander, Lt. R. J. Divers, Sec. Lt. J. S. Wharrie-Smith, April 23rd; Sec. Lt. A. A. Iker, Lt. A. E. Rintoul, Lt. C. S. Richmond, Sec. Lt. A. H. Stickle, April 24th; Lt. H. E Ambrose, Lt. C. H. Denny, Sec. Lt. A. R. Deans, Lt. C. A. Grant, April 25th; Sec. Lt. J. R. Hack, Lt. H. T. Harrison, Sec. Lt. G. Straw, April 26th; Lt. E. F. Haselden, April 27th; Sec. Lt. J. A. Ottaway, April 28th; Lt. R. Harris, Sec. Lt. G. S. Shackleton, Capt. E. G. Whelon (R. Sussex R.), April 29th; Sec. Lt. (Hon Capt.) D. I. M. Kennard, Lt. F. A. Sedore, May 1st; Lt. J. A. Atkins, Sec. Lt. A. G. Boff, Lt. P. W. Knight, May 2nd; Lt. J. E. Agnew, Lt. (actg. Capt.) A. N. Atkey, M.C., Sec. Lt. F. L. Ferrier, Sec. Lt. T. T. Orde, May 3rd; Sec Lt. A. C. Anderson, Lt. C. L. Middleton, May 4th; Lt. L. W. Beal, Sec. Lt. A. E. Mileham (R.W. Kent R.), May 5th; Lt. (Hon. Capt.) J. H. H. Goodall (York and Lancs. R.), May 6th; Sec. Lt. W. C. Benton, Sec. Lt. F. W. Barker, Lt. (actg. Capt.) J. Bussey, Sec. Lt. P. H. Evans, Lt. (actg. Capt.) W. G. Cardia, Sec. Lt. L. C. Chandler, Lt. P. V. G. Chambers, Sec. Lt. G. B. Moxon, May 7th; Lt. F. P. Adams, Sec. Lt. W. T. Allen, Sec. Lt. G. P. Ashcroft, Sec. Lt. J. A. L. Brown (Notts and Derby R., T.F.), Sec. Lt. F. K. Cleall, Sec. Lt. R. P. Caton, Sec. Lt. T. C. Chattoe (R.G.A.), Lt. F. W. C. Davies, Sec. Lt. R. E. Gillispie, Sec. Lt. A. J. Hamilton, Lt. H. Kingsbury, Sec. Lt. J. D. McKeogh, Sec. Lt. N. J. Moran, Sec. Lt. M. P. Morgan, Sec. Lt. G. I. Neale, Lt. O. W. Pellatt, Lt. S. H. Warner, Lt. A. V. Wills, May 8th; Sec. Lt. H. W. Burry, Lt. H. A. Brown, Sec. Lt. A. E. Brealey, May 9th; Sec. Lt. W. Anderson, Sec. Lt. S. A. Banton, Sec. Lt. C. J. A. Berkeley, Lt. G. A. Bird, Lt. H. J. P. Bomford (Lond. R., T.F.), Sec Lt. (Hon. Lt.) P. B. Davies, Sec. Lt. H. P. C. Green, Sec. Lt. I. K. Gillispie (Army Cyc. Corps), May 10th; Sec. Lieut. A. Beedie, Lieut. E. G. Bridges, Sec. Lieut. H. D. Beresford, Lt. R. F. Gill, May 11th; Sec. Lt. F. S. Adams, Sec. Lt. F. H. Brewitt, Sec. Lt. N. Price, Lt. H. A. Pike, Lt. J. R. Pattisson, Sec. Lt. G. C. A. Parker, Lt. W. W. Vigess (R.E., T.F.), May 12th; Lt. B. A. R. Beechino, Lt. F. Noble, Sec. Lt. (Hon. Lt.) R. D. De Pass, Sec. Lt. C. R. C. Pink, May 13th; Sec. Lt. H. E. Blades, Sec. Lt. C. B Cheetham, Sec. Lt. A. W. Parr, May 14th; Sec. Lt. K. McC. Dolbey, Sec. Lt. G. B. Fairhurst, Sec. Lt. H. Mason, Sec. Lt. W. T. Neilson, Sec. Lt. J. M. Petch, May 15th; Sec. Lt. G. H. Dixon, May 16th; Lt. R. M. Davison, Sec. Lt. M. F. McDonald, May 17th; Lt. A. V. Stupart, D.F.C., May 18th; Sec. Lt. A. W. Allis, Lt. T. A. G. Bishop, Sec. Lt. D. A. Black, Sec. Lt. C. C. Crossley, Lt. H. McL. Ferguson, Sec. Lt. C. Nash, May 19th; Sec. Lt. R. G. Adams, Sec. Lt. A. F. Arnold, Sec. Lt. W. L. Atheridge, Sec. Lt. W. H. August, Sec. Lt. H. F. Bates, Sec. Lt. C. A. Beattie, Lt. R. F. Barnes, Sec. Lt. J. W. Bellah, Sec. Lt. W. M. Bergey, Sec. Lt. K. W. Biglow, Sec. Lt. E. R. Bradley, Sec. Lt. B. R. Brown, Lt. H. F. Balmer, Sec. Lt. I. B. Badgley, Lt. W. H. Boyd, Sec. Lt. E. E. Brown, Capt. C. H. S. Butterworth, Sec. Lt. H. C. Bourke, Lt. (actg. Capt.) R. M. Berthe, Sec. Lt. O. S. Clefford-Linham, Capt. A. W. Carter, D.S.C., Lt. E. O. Copas, Sec. Lt. R. B. Crawford, Sec. Lt. F. Charlesworth, Sec. Lt. W. L. Case, Sec. Lt. F. L. J. Cook, Sec. Lt. J. G. Callaghan, Sec. Lt. H. F. Conroy, Sec. Lt. J. W. Cruikshank, Sec. Lt. A. Crockard, Sec. Lt. A. L. Corson, Sec. Lt. F. D. Chisholm, Sec. Lt. D. M. Crater, Sec. Lt. J. Copeland, Sec. Lt. D. Calder, Lt. F. Fredrickson, Sec. Lt. P. L. Fannen, Sec. Lt. G. F. Geiger, Sec. Lt. H. S. McFadden, Sec. Lt. C. E. Mitchell, Sec. Lt. E. J. Murray, Lt. H. A Miller, Lt. E. G. Macpherson, Sec. Lt. W. B. Mavity, Sec. Lt. J. M. Meston, Sec. Lt. M. H. McRae, Lt. G. L. Macpherson, Sec. Lt. F. L. McArthur, Sec. Lt. A. R. Macpherson, Sec. Lt. L. W. Marwick, Sec. Lt. M. P. Nesbit, Sec. Lt. R. T. Nixon, Sec. Lt. R. G. Ostrann, Sec. Lt. P. T. R. Payne, Sec. Lt. W. C. Peat, Sec. Lt. J. T. Pelletier, Sec. Lt. B. S. Philp, Lt. B. B. Perry, May 20th; Lt. O. A. Moore, Sec. Lt. D. B. Menzies, Lt. C. H. Moss, Lt. A. McM. Philips, D.F.C., Sec. Lt. G. W. Porter, Sec. Lt. H. J. Philp, May 21rd; Lt. C. G. Crane, May 25th; Lt. N. B. Arbuthnot, May 26th.

Lt. J. Wingate resigns his commn. in order to resume his medical studies, and is permitted to retain his rank, Jan. 8th.

The following Lts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank :—E. Evans, Jan. 20th (substituted for notification in "Gazette," Jan. 28th); H. J. W. McConnell, May 10th; M. T. McKelvey, May 14th; L. L. Miller, May 16th.

The following Lts. relinquish their commns. on account of ill-health :—S. R. Lesley (Suss. Yeo.), W. Kirkpatrick (contracted on active service) (Lanark Yeo.), H. A. Scaby (R.F.A.), May 20th.

Lt. H. Roberts resigns his commn., May 28th.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—A. S. Helmer, March 8th; H. J. Clark (contracted on active service), May 13th; P. Girvin, May 20th.

Sec. Lt. (Hon. Lt.) W. Cooke relinquishes his commn on account of ill-health contracted on active service, May 3rd.

Sec. Lt. W. H. Boite to take rank and prec. as if his appointment as Sec. Lt. bore date April 7th.

T. H. Delany is antedated in his appointment as Sec. Lt. (A.), Aug 8th, 1918.

The surname of F. G. Tolmie is as now described, and not Tomlie, as stated in "Gazette," Aug. 30th, 1918.

The notification in "Gazette," April 1st, concerning Lt. J. Wingate is cancelled.

The notification in "Gazette," Feb. 25th, concerning Sec. Lt. C. O. Carson is cancelled.

The notification in "Gazette," March 11th, concerning Sec. Lt. H. H. Bland is cancelled ("Gazette" notice of March 14th to remain).

The notification in "Gazette," April 29th, concerning Sec. Lt. P. C. Brazier is cancelled.

The notification in "Gazette," Jan. 14th, concerning Sec. Lt. A. S. Helmer is cancelled.

The notification in "Gazette," Jan. 14th, concerning Sec. Lt. H. J. Welsh is cancelled.

The notifications in "Gazette," May 13th, concerning the following officers are cancelled:—Lt. F. C. Shirtcliffe, Capt. F. W. Walker.

ADMINISTRATIVE BRANCH.—Lt.-Col. E. H. Davidson, O.B.E., M.C., to be Lt.-Col. on relinquishing the appointment of Deputy Director at the Air Ministry, May 1st.

Lt.-Col. D. Powell, C.B.E., to be Lt.-Col., from (S.G.), May 1st.

Capt. (actg. Maj.) N. A. Daniell to be actg. Maj. whilst empld. as Maj., from (S.O.), and relinquishes the grading for purposes of pay and allowances as (S.O.), from Jan. 7th to April 30th.

Capt. (Hon. Maj.) (actg. Maj.) R. H. Howell retains the actg rank of Maj. whilst empld. as Maj., from (S.O.), from Nov. 10th, 1918, to April 30th.

Capt. G. R. Turner to be graded for purposes of pay and allowances as Maj. whilst so empld., May 1st.

Capts. to be graded for purposes of pay and allowances as Maj. whilst empld as Majs.:—W. Cowell, E. E. K. Heathcote, (Hon. Maj.) T. M. Ross, A. M. Wilson, May 1st.

Lt. W. H. Osman to be graded for purposes of pay and allowances as Maj. whilst empld. as Maj., May 1st.

Capt. R. J. G. Temple to be Capt., from (T.), May 17th.

Sec. Lts. to be actg. Capts. whilst empld. as Capts.:—(Actg. Lt.) R. E. Cunningham, from Dec. 15th, 1918, to March 21st; F. T. Dixon, from March 1st to April 30th; H. J. De Wall, from March 12th to April 30th.

Lts. to be graded for purposes of pay and allowances as Capts. whilst empld. as Capts.:—(Hon. Capt.) W. C. Alexander, E. L. Ardley, N. B. Jarman, (Hon. Capt.) R. S. J. Bond-Andrews, (Hon. Capt.) T. E. Gentles, (Hon. Capt.) F. C. McBride, L. J. N. Mackay, (Hon. Capt.) F. J. McKenna, J. A. McLaren, M.C., W. J. Matthews, (Hon. Capt.) C. W. A. Millar, P. J. Murphy, G. V. Walsh, L. L. Wight, M.C., May 1st.

Lts. to be graded for purposes of pay and allowances as Capts. whilst empld. as P.T. Officers:—I. Butterfield, A. F. Chilcott, I. E. Cording, M.C., W. H. Downs, N. M. Hoskins, K. S. Hunter, R. Kane, R. E. Martin, G. L. Moss, M.C., May 1st.

E. Newman (Capt., A.O.D.) is granted a temp. commn. as Lt., Aug. 8th, 1918, and to be Hon. Capt.

Sec. Lts. to be graded for purposes of pay and allowances as Lt. whilst empld as Lts.:—E. J. Raymond, W. R. Castings, G. A. Middleweek, W. J. Scarff, A. P. Johnston, G. E. Blake, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Lts. while empld. as P.T. Officers:—A. E. F. McCreary, G. H. Price, R. N. Laub, May 1st.

Sec. Lt. (Hon. Capt.) C. B. Dick-Cleland to be Sec. Lt. from (T.), and to be Hon. Capt. and graded for purposes of pay and allowances as Lt. whilst empld. as Lt., May 1st.

Sec. Lts. to be Sec. Lts.:—V. D. Smith, Dec. 7th, 1918; I. Holliday, April 17th.

Sec. Lts. (O.) to be Sec. Lts.:—W. J. Barker, Nov. 18th, 1918; J. W. Clarke, May 2nd; F. E. L. Elliott, May 7th.

The following Sec. Lts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lts.:—R. N. Preece, June 28th, 1918; J. F. Forbes, Nov. 16th, 1918; G. W. Colebourne, March 1st; R. Craig, April 17th.

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. (actg. Lt.) L. M. King-Harman (Lt., Kife Bde.), April 2nd; Capt. A. J. R. Waller (Capt., Essex R.), May 2nd; Lt. (actg. Maj.) Hon. F. W. Bampfylde (Lt., Devon R.), May 15th.

Transferred to the unempld. list:—Maj. A. N. Stuart, Jan. 14th; Lt. S. Wilmett, Feb. 13th; Sec. Lt. A. Winpenny, Feb. 22nd; Lt. J. N. Stennett, 23rd; Sec. Lt. H. C. Scovell, March 11th; Sec. Lt. W. Cowden, March 13th; Sec. Lt. H. Vincent, May 21st; Lt.-Col. Hon. C. A. Ward, M.V.O., March 22nd; Sec. Lt. G. Waugh, March 23rd; Sec. Lt. W. B. Walker, D.F.C., March 25th; Sec. Lt. L. G. Cartwright, March 26th; Sec. Lt. M. P. Dalrymple, April 1st; Sec. Lt. L. McLeod Moffats, Sec. Lt. J. B. Rennick, April 9th; Sec. Lt. T. H. Wroughton, April 10th; Sec. Lt. A. Sharples, Lt. C. C. Statt, April 14th; Sec. Lt. W. Gow, Lt. (actg. Capt.) J. V. Hay, Lt. (actg. Capt.) M. G. Kiddy, April 15th; Capt. E. W. S. Cotterill, April 17th; Sec. Lt. G. C. Shakespeare, April 21st; Sec. Lt. E. R. Greenhow, April 23rd; Sec. Lt. C. W. Starke, April 24th; Sec. Lt. H. T. Sharp, April 25th; Lt. J. Pilkington, Sec. Lt. J. Warren-Foster, April 29th; Lt. (actg. Capt.) A. T. Gammon, Lt. (actg. Capt.) P. W. Malthouse, Sec. Lt. C. F. Nurse, April 30th; Lt. R. S. Ashby, Capt. (actg. Maj.) C. Hayes, May 1st; Sec. Lt. A. Bruffton, Lt. (actg. Capt.) W. E. Cranmer, May 2nd; Sec. Lt. Pritchard, May 3rd, Sec. Lt. C. R. Calder, Sec. Lt. R. Carr, May 6th; Sec. Lt. L. Winwood, May 7th; Lt. C. B. Charlewood, May 8th; Sec. Lt. J. E. De Casmaker, May 9th; Sec. Lt. H. C. Beaumont, Lt. J. W. Parsons, May 10th; Lt. (actg. Capt.) W. F. Fletcher, Sec. Lt. F. C. Whitten, May 11th; Sec. Lt. W. Mahony, May 12th; Lt. C. V. Marsh (R.N.V.R.), Capt. G. F. Wilson (Seaforth Highrs., T.F.), May 13th; Sec. Lt. H. C. Bryant, Sec. Lt. L. Glasspole, May 14th; Sec. Lt. (actg. Lt.) C. Gruchy, Sec. Lt. F. Heath, Lt. L. J. Mars, May 15th; Lt. C. C. Duffield, Sec. Lt. F. J. Madden, May 17th; Sec. Lt. F. W. Anderson, Sec. Lt. T. Fraser, Sec. Lt. A. A. S. Milne, Sec. Lt. R. A. Peterson, Lt. W. K. Prendergast, May 20th; Lt. (actg. Capt.) C. E. Crabbe, May 22nd.

The following relinquish their commns. on account of ill-health, and are permitted to retain their rank:—Capt. J. Bushell, May 14th; Sec. Lt. J. G. Elliott, May 9th (substituted for notification in "Gazette," May 16th).

Sec. Lt. C. O. Bennett resigns his commn., May 28th.

The surname of E. H. W. Darby is as now described, and not Darley, as stated in "Gazette," Feb. 7th.

The notification in "Gazette," Feb. 14th, concerning Sec. Lt. G. P. Forbes is cancelled.

The notification in "Gazette," April 20th, concerning Lt. T. F. X. Smallwood is cancelled.

The notification in "Gazette," May 6th, concerning Capt. (Hon. Maj.) (actg. Maj.) R. H. Howell is cancelled.

TECHNICAL BRANCH.—Majs. to be graded for purposes of pay and allowances as Lt.-Cols. while empld. as Lt.-Cols., Grade (A.):—W. J. Fernie, O.B.E., J. G. Bayes, O.B.E., May 1st.

Capts. to be graded for purposes of pay and allowances as Lt.-Cols. while empld. as Lt.-Cols., Grade (A.):—L. B. Cook, W. W. Farthing, O.B.E., May 1st.

Maj. R. F. Le Bailly to be Maj., Grade (A.), from (Ad.), April 28th.

Capt. (actg. Maj.) D. M. P. Roach, M.B.E., to be Capt., and retains the actg. rank of Maj., Grade (A), from (S.O.), April 21 to April 30.

Capts. to be graded for purposes of pay and allowances as Majs., Grade (A), while so empld.:—A. Hunter, F. W. H. Lerwill, May 1st.

Capt. L. Auker, O.B.E., to be graded for purposes of pay and allowances as Maj., Grade (B), while so empld., May 1st.

Capts. to be graded for purposes of pay and allowances as Maj. while empld. as Maj., Grade (A):—J. D. Blyth, J. J. Botterill, A. Clayton, S. Curtis, W. J. B. Curtis, O.B.E., A. Graves, (Hon. Maj.) A. E. Hatton, W. A. B. Laing, T. Martin, O.B.E., R. K. Paton, W. O. Pearce, E. S. Sturdee, O. C. Williams, K. J. Young, May 1st.

Capt. C. Matthews to be graded for purposes of pay and allowances as Maj. while empld. as Maj., Grade (B), May 1st.

Lts. to be graded for purposes of pay and allowances as Majs. while empld. as Majs., Grade (A):—F. B. Adams, C. A. Doherty, H. V. Snook, May 1st.

Sec. Lts. to be graded for the purposes of pay and allowances as Majs. while empld. as Majs., Grade (A):—C. C. Lees (and to be Hon. Lt.), R. B. Stephenson, A. J. Toomer, May 1st.

Capt. H. G. Henley to be Capt., Grade (A), from (A), Feb. 17th.

Capt. W. E. G. Beaufort-Greenwood to be Capt., Grade (A), from (S.O.), May 1st.

Lts. to be actg. Capts. while empld. as Capts., Grade (A):—G. A. Lawler, from Oct. 1st, 1918, to April 30th (Substituted for notification in "Gazette," Feb. 21st); G. W. M. Whitton, from April 5th to April 30th.

Sec. Lt. J. W. Hoskings, M.B.E., to be actg. Capt. while empld. as Capt., Grade (A), from Feb. 1st to April 30th.

Sec. Lt. (actg. Lt.) A. G. Ridgon to be actg. Capt. while empld. as Capt., Grade (B), from Nov. 30th, 1918, to April 30th.

Lts. to be graded for purposes of pay and allowances as Capts. while empld. as Capts., Grade (A):—H. A. Braddock, P. Burke, H. H. Chivers, A. H. Ellis, (Hon. Capt.) W. H. Elison, R. P. Grant, G. S. Hallas, M.C., H. E. Hazlehurst, G. Heath, G. W. Hippisley, (Hon. Capt.) G. Hole, T. Kerr-Jones, H. Meldrum, (Hon. Capt.) C. R. G. Topham, G. M. W. Whitton, May 1st.

Lts. to be graded for pay and allowances as Capts. whilst empld. as Capts., Grade (B):—F. G. J. Didden, G. F. Drudge, May 1st.

Lt. J. R. S. Borman to be Lt., from (Ad.), and to be graded for purposes of pay and allowances as Capt. whilst empld. as Capt., Grade (B), May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Capts. whilst empld. as Capts., Grade (A):—C. A. Assiter, and to be Hon. Lt. L. H. Bainton, and to be Hon. Lt., R. C. Bishop, and to be Hon. Lt., H. L. Brown, P. V. Davies, E. W. Dawson, L. A. Hooper, W. G. Kentfield, H. D. Staiar, and to be Hon. Lt., B. P. K. Walshe, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Capts. whilst empld. as Capts., Grade (B):—I. W. Allen, and to be Hon. Lt., F. A. Chorley, J. Tinsley, May 1st.

Lt. E. S. Pearse to be Lt., Grade (B), from (S.O.), April 15th.

Sec. Lt. M. Sheriff, D.C.M., to be actg. Lt. whilst empld. as Lt., Grade (A), from Dec. 2nd, 1918, to April 30th.

Lt. S. T. Kemp to be graded for purposes of pay and allowances as Lt whilst empld. as Lt., Grade (A), May 1st.

Lt. W. J. Hembry to be graded for purposes of pay and allowances as Lt., Grade (B), from Dec. 1st, 1918, to April 30th.

Sec. Lts. to be graded for purposes of pay and allowances as Lts. whilst empld. as Lts., Grade (B):—W. Gregory, W. J. Hembry, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Lts. whilst empld. as Lts., Grade (A):—W. T. Henry, L. J. Lesser, P. G. May, E. J. Hindsley, S. Jupp, B. E. D. Pratt, H. E. Powell, H. H. Fell, J. G. Peacock, W. J. Root, and to be Hon. Lt., J. R. Cross, J. Wilson, R. N. Tweedy, and to be Hon. Lt., C. W. Grey, A. Wombwell, T. Honor, H. D. Lumb, R. W. Edwards, W. Gill, W. Wheatley, P. J. Whitehead, H. Waklly, C. F. Hayman, G. H. Pack, A. E. Case, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Lts whilst empld. as Lts., Grade (B):—J. O. Miles, A. Crook, and to be Hon. Lt., W. G. Shipwright, J. Dale, W. F. Arnold, A. E. Wycherley, May 1st.

Sec. Lt. J. H. Lester to be Lt., without pay and allowances of that rank, April 18th.

Sec. Lt. R. A. Bell to be Sec. Lt., Grade (A), from Grade (B), March 7th.

Sec. Lt. H. P. Bolt to be Sec. Lt., Grade (A), from (Ad.), May 7th.

Sec. Lt. R. S. Bayeo to be Sec. Lt., Grade (B), from (A), Jan. 16th.

Sec. Lts. (Ad.) to be Lts., Grade (B):—(Hon. Lt.) U. B. Gilbert, and to be Hon. Lt., Oct. 1st, 1918; B. H. W. Hatch, May 12th.

Sec. Lt. R. R. Wilson (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt., June 24th, 1918.

Transferred to unempl. list:—Sec. Lt. (Hon. Lt.) J. J. Martin, Feb. 12th; Lt. (actg. Capt.) J. Wingate, Feb. 25th; Sec. Lt. J. Wilson, Feb. 28th; Sec. Lt. (actg. Lt.) G. R. Eaton, Capt. W. Young, March 31st; Sec. Lt. J. L. Cleland, April 1st; Sec. Lt. E. Long, April 11th; Sec. Lt. E. A. O. Hobart-Hampden, Sec. Lt. (Hon. Lt.) B. H. Hardy, April 12th; Lt. (Hon. Capt.) F. L. Royle (T.O.Y.L.), April 13th; Lt. (actg. Capt.) A. E. Fisher, Lt. (actg. Capt.) G. E. Heseltine, April 15th; Capt. N. H. Terry, April 17th; Sec. Lt. F. Robins, April 21st, Sec. Lt. (Hon. Lt.) P. E. Harris, April 31st; Lt. A. A. Davis, May 1st; Lt. A. Gane, May 2nd; Sec. Lt. (actg. Lt.) C. E. Armand, May 4th; Sec. Lt. T. L. Collins, Sec. Lt. (actg. Lt.) W. G. Mantell, May 5th; Sec. Lt. (Hon. Lt.) L. C. Coward, Capt. A. Eve (T.F. Res.), May 6th; Lt. H. L. Craymer, Capt. S. L. Dashwood, M.B.E., May 7th; Lt. F. W. Atkinson, May 8th; Capt. A. C. S. Couldwell, May 10th; Sec. Lt. L. Knowles, May 11th; Sec. Lt. G. Betts, Capt. L. C. Cox, May 12th; Lt. W. P. Frecth, Sec. Lt. B. De B. Gates, Capt. A. B. W. Greenhough, M.B.E., M.C., Sec. Lt. R. Hagon, Lt. D. B. Wilson, M.C., May 13th; Sec. Lt. (Hon. Lt.) (actg. Capt.) C. H. Blakeway, Capt. (actg. Maj.) J. H. Cotton, Capt. (actg. Maj.) L. Crooks, Maj. (actg. Lt.-Col.) M. O. Darby, Capt. (actg. Maj.) H. G. Day, May 14th; Sec. Lt. A. J. Green, Lt. H. Marsh, Lt. R. M. Penman, Capt. L. A. Price, May 15th, Capt. W. A. Morrison, May 16th; Sec. Lt. I. D. Bennett, Sec. Lt. R. C. Gould (Devon R.), May 20th.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—H. T. Hickey (contracted on active service), May 17th; C. H. MacKinnon, May 20th.

The notification in "Gazette," Jan. 7th, concerning Lt. (actg. Capt.) J. Wingate is cancelled.

The notification in "Gazette," March 18th, concerning Capt. W. E. Smith is cancelled.

MEDICAL BRANCH.—H. A. Treadgold is granted a temp. commn. as Capt. and to be temp. Maj. without pay and allowances of that rank, Sept. 2nd, 1918, & May 1st, 1918 (substituted for notification in "Gazette," Sept. 24th, 1918).

Capt. A. G. Graham is antedated in his appointment to July 1st, 1918.

Transferred to unempld list.—Capt. J. E. Cable, May 8th; Capt. C. K. Attlee, May 11th; Capt. D. A. MacPherson, May 14th.

CHAPLAIN'S BRANCH.—Transferred to the unempld. list:—Capt. W. H. B. Gibbs, May 9th; Capt. W. Galsin, May 18th.

MEMORANDA.—The following are granted the actg. rank stated against their names, with effect from May 1st:—

To be actg. Lt.-Cols.:—Lt.-Col. A. D. Cunningham, while empld. in the Airships Department, Admiralty; Lt.-Col. B. H. O. Armstrong, C.M.G., while empld. as Director of Inland Works; Lt.-Col. T. D. Mackie, C.M.G., O.B.E., while empld. as Director of Air Construction Service.

To be actg. Lt.-Cols.:—Maj. A. V. J. Richardson (substituted for the notice in "Gazette," May 20th); Maj. A. B. F. Carter, O.B.E., while empld. as Assistant Director of Air Construction Service; Maj. J. M. Bayes, O.B.E., while empld. as Area Officer in the Depart. of A.C.S.; Maj. W. J. Fernie, O.B.E., while empld. as Area Officer in the Depart. of A.C.S.; Maj. J. D. K. Restler, while empld. as Chief Elec. Engineer in the Depart. of A.C.S.; Maj. C. Barber, while comdg. a Stores Depôt; Maj. R. Grey, while specially empld.; Maj. L. Tomkinson, while specially empld.; Capt. G. W. Parkinson, M.C., while empld. as Assistant Director of Inland Works; Capt. C. Cookson, while empld. as Assistant Director of Inland Construction; Capt. W. Farthing, O.B.E., while empld. as Area Officer in the Depart. of A.C.S.; Capt. L. B. Cook, while empld. as Area Officer in the Depart. of A.C.S., Capt. O. Lindquist, while comdg. a Stores Depôt.

To be actg. Majs.:—Capt. R. A. Laws, while specially empld. with the Depart. of A.W.B.; Capt. J. C. Watson, while specially empld. with the Depart. of A.W.B.; Capt. D. Goad, while empld. as Senior Elec. Officer in the Depart. of A.C.S.; Capt. A. Young, while comdg. a Stores Depôt; Capt. J. R. Harland, while empld. as Officer i/c of Maintenance in the Depart. of A.C.S.; Capt. E. F. W. Cherry, while empld. as Officer i/c of Stores in the Dept. of A.C.S.; Capt. J. P. Coleman, A.F.C., while specially empld; Capt. P. G. N. Ommanney, while empld. in the Airship Dept., Admiralty; Capt. H. J. Pritchard, while empld. in the Airship Dept., Admiralty; Capt. A. Price-Reed, while empld. in the Airship Dept., Admiralty; Capt. G. Somers-Clarke, while specially empld.; Capt. F. L. Robinson, M.C., while specially empld.; Capt. C. R. Carr, while specially empld.; Capt. S. W. Dunckley, while specially empld.; Capt. F. S. Molier, M.C., while specially empld.; Capt. G. L. Paine, while specially empld.; Lt. A. W. Clegg, while specially empld. as Chief Water Engineer with the Dept. of A.W.B.; Lt. H. S. Watson, while empld. as Deputy Chief Elec. Engineer with the Dept. of A.W.B.; Capt. H. R. B. Hull.

To be actg. Hon. Majs.:—Capt. G. W. C. Kaye, while specially empld.; Capt. H. Myers, while specially empld.

To be actg. Capts.:—Lt. F. M. F. West, V.C., M.C., while empld. as Liaison Officer for Air Intelligence; Lt. F. Edwards, while empld. in the Airship Dept., Admiralty; Lt. W. J. C. Kendall, M.C., while empld. as Officer i/c of R.A.F., Repatriation Records; Lt. G. N. Trace, while specially empld.; Lt. A. Carey, while specially empld.; Lt. F. Lord, while specially empld.; Lt. W. R. S. Humphreys, while specially empld.; Lt. B. R. Bostock, while specially empld.; Lt. E. Brown, while specially empld.; Lt. J. C. Cantrill, while specially empld.; Lt. E. Burney, M.C., while specially empld.; Lt. W. S. C. Smith, while specially empld.; Lt. W. B. Thomas, while specially empld.; Lt. F. V. Robinson, while specially empld.; Sec. Lt. J. W. Tattersall, while specially empld.; Sec. Lt. D. MacDougall, while specially empld.; Sec. Lt. N. Bucknall, while specially empld.; Sec. Lt. W. Borland, while specially empld.

To be actg. Lts.:—Sec. Lt. H. D. Lumb, while empld. in the Airship Dept., Admiralty; Sec. Lt. W. A. Fowler, while empld. as Group Educational Officer; Sec. Lt. M. Sheriff, D.C.M.

The following are granted the hon. rank of Capt.:—Lt. J. B. Runciman, June 11th, 1918; Lt. J. G. Halsam, Nov. 9th, 1918; Sec. Lt. (actg. Capt.) G. H. Hill, March 31st.

The following Overseas Cadets are granted temp. commns. as Sec. Lts.:—863088 R. Ardin, 172727 E. D. Bate, 171604 O. E. Byers, 172852 F. Bullock, 209811 A. E. Beck, 184499 J. Christie, 316707 E. H. Cuckow, 316270 W. H. Campbell, 171473 J. S. Cape, 116104 M. Connell, 24118 W. E. Cooper, 36055 E. J. Cosford, 153682 D. L. Chambers, 778150 G. Couper-Thwaite, 754144 W. A. Chisholm, 316321 E. J. Diespecker, 316233 C. F. Dioron, 171502 J. H. Dietrich, 172690 C. L. Dowsley, 316285 J. H. Donelly, 316375 J. W. Donald, 1030769 F. L. Dunn, 172542 W. C. Delapp, 172691 C. Demars, 172466 F. Dorien, 154850 H. H. Dolmage, 154762 R. R. De Long, 316386 R. L. Emprey, 316354 R. H. Elgie, 172829 R. M. Edgar, 259106 N. F. Evans, 316329 L. E. Fairburn, 316294 S. Field, 316291 L. G. Foss, 1977 M. Gray, 92756 E. A. Fergusson, 316370 T. B. Friend, 316030 J. M. Fraser, 213000 N. H. Grills, 316320 T. D. Guerney, 316093 J. A. Green, 690063 G. N. Goodman, 513494 A. G. Green, 301767 A. Gillespie, M2/153348 E. H. Hanbury, 172057 D. Hannerson, 727582 J. T. Hockey, 2572 G. A. Hefferman, 172568 C. Horner, 171730 H. E. Heath, 172729 A. Hall, 48736 A. F. Huff, 184101 N. W. S. Hunter, 15345 S. T. Harvey, 316234 W. J. Hasdell, 172128 S. Honeyman, 316307 H. C. Holden, 57020 R. Hulland, 542174 T. F. Holtz, 316222 H. Haywood, 316254 J. A. Johnson, 171781 R. Johnson, 1258006 L. B. Keating, 172353 A. E. Kerr, 154236 A. W. Kerridge, 316358 R. H. Kelly, 182249 J. Killin, 316310 D. J. Lodgate, 502497 A. E. Long, 184258 J. Love, 316233 J. G. Lyons, 316245 R. Laing, 886, L. D. Law, 76913 G. V. Lowry, 166 S. G. Lorraine, 316298 P. A. McCandless, 316209 R. M. McLenaghen, 172751 D. Moir, 171471 W. F. Morrin, 171934 W. S. McKeown, 172717 R. A. McNaught, 316566 H. S. M. Moore, 907277 H. K. Mason, 316256 D. A. McKeague, 841290 W. S. McCutcheon, 504910 J. Mehagen, 231151 R. E. Mould, 48741 W. Morrison, 704130 Morrison, 316241 J. H. McDonald, 316271 C. G. A. Marple, 153977 S. A. McLean, M/119334 W. W. Manning, 525562 G. B. Nellands, 171557 J. H. O'Connor, 171457 G. F. Penny, 316290 C. W. Perrett, 172872 L. M. Peine, 172880 P. J. Potter, 184713 C. Portsmouth, 316356 G. F. Plumb, 512112 R. S. Pidcock, 316313 A. Rae, 180335 W. J. A. W. Roulston, 171676 J. G. Robertson, 172282 R. Ross, 316224 A. H. Roy, 171587 J. Robinson, 316565 A. M. Russell, 316248 S. F. Roe, 5402254 W. H. Russell, 316304 W. A. Smith, 171850, A. St. Jeans, 316305 W. H. Stanton, 316315 H. C. Startup, 112138 C. E. Summner, 182121 A. A. Smith, 171863 A. E. Smith, 172532 D. Smith, 171036 C. N. Stevens, 393820 H. W. Scott, 171038 G. L. Stevens, 637 G. K. Spruitt, 154217 D. H. Stewart, 171241 C. A. Sturdy, 316356 P. G. Solloway, 126768 C. L. Shields, 171036 C. N. Stevens, 343420 C. W. Scott, 316286 H. R. Thornton, 172811 J. M. Tate, 171927 B. Tompkins, 166138 J. C. Thompson, 219142 J. V. Thompson, 418524 H. I. Wilson, 312868 L. B. West, 316216 F. Wright, 154220 A. L. Wheeler, 316366 A. E. Walker, 316325 L. B. Weldon, 316152 W. C. H. Webb, 316230 E. A. Ware, 171545 W. B. Whitley, 184357 H. W. Whistler, 895270 D. S. Wylie, 154790 E. C. S. Winternute, Feb. 15th.

Col. W. B. Caddell relinquishes his commn. on ceasing to be empld., and is granted the hon. rank of Brig.-Gen., May 28th.

Transferred to unempld. list:—Lt.-Col. G. Waddell, from (S.O.) March 28th; Sec. Lt. (Hon. Lt.) (actg. Capt.) E. Vevers, from (S.O.), March 31st; Lt. (actg. Maj.) D. L. Blumenfield, from (S.O.), April 1st.

Capt. (actg. Maj.) W. T. Blake (Oxon and Bucks. L.I.) relinquishes his commn. on account of ill-health, May 15th.

AIR MINISTRY, May 30th.

R.A.F.—The following temp. appointments are made at the Air Ministry:—Staff Officers, 1st Class (P.).—Lt.-Col. I. T. Courtney, Lt.-Col. K. G. Brooke, from (Director), May 1st.

Staff Officers, 2nd Class (Air).—Lt.-Col E. L. Gossage, M.C., Capt. R. B. Maycock, O.B.E., Maj. O. G. G. Villiers, D.S.O. (P.).—Maj. A. H. S. Steele-Perkins, O.B.E., from S.O., 1st Class, May 1st.

Staff Officers, 3rd Class (Air).—Capt. E. O'D. Crean, Lt. A. Rowan, Lt. R. Gambier-Parry. (P.).—Capt. C. G. Murray, May 1st.

Staff Officers, 4th Class (P.).—Lt. A. W. Symington, M.C., Lt. E. N. T. Edwardes, May 1st.

The following temp. appointments are made:—Staff Officer, 2nd Class (P.).—Maj. R. Hilton-Jones, O.B.E., May 23rd.

Administrative.—Capt. E. H. T. Atkinson to be actg. Maj. whilst so empld., from April 19th, 1918, to May 31st.

Staff Officers, 3rd Class (Q.).—Lt. T. T. Pickup, and to be actg. Capt. whilst so empld. till April 30th, vice Capt. H. R. Radford, April 24th. (T.).—Sec. Lt. H. F. Webb, and to be actg. Capt., from Feb. 18th to April 30th.

FLYING BRANCH.—Maj. J. C. P. Wood to be Maj. (A. and S.), from unempld. list, May 6th, seny. April 1st, 1918, next below B. Travers

Capt. (actg. Maj.) T. F. N. Gerrard, D.S.C., to be Capt. (A. and S.), and relinquishes the actg. rank of Maj., April 22nd.

Sec. Lt. V. O. Hillyard to be Lt., June 25th, 1918.

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. (Hon. Lt.) L. A. Naylor (Lt., Nova Scotia R.), Dec. 29th, 1918; Lt. (actg. Capt.) D. J. Nickle (Capt., Can. Forestry C.), Jan. 12th; Lt. J. Grimshaw (Lt., Manitoba R.), Jan. 30th; Sec. Lt. R. M. Close (Sec. Lt., Notts and Derby R.), Feb. 3rd; Sec. Lt. (Hon. Capt.) W. G. Shedel (Lt., R. Fusiliers), Feb. 27th; Lt. A. B. Raymond (Capt., Can. A.S.C.), March 5th; Sec. Lt. (actg. Capt.) E. A. Johnson (Lt., C. Ontario R.), March 9th; Lt. C. R. Millington (Sec. Lt., R.G.A.), March 21st; Sec. Lt. (Hon. Lt.) T. J. D. Reid (Lt., L. and B. Horse Yeo.), April 1st; Lt. H. D'A. McGrath (Lt., B. Col. R.), April 10th; Sec. Lt. (Hon. Lt.) L. C. Herne (Lt., B. Col. R.), April 16th; Sec. Lt. (Hon. Lt.) E. C. Clegg, M.C. (Lt., Wilt. R.), May 5th; Lt. C. E. Rendall (Lt., R.F.A.), May 6th; Lt. W. A. Ross (Lt., Sask. R.), May 8th; Sec. Lt. A. G. L. Sidwell (Lt., R. Dub. Fus.), May 11th; Lt. H. B. Morkhill (Lt., Yorks R.), May 15th; Lt. A. G. Lough (Lt., Cent. Ont. R.), May 16th; Lt. L. A. Newbold (Lt., Essex R.), May 22nd; Maj. G. D. Hill (Capt., Hussars), May 26th.

Transferred to unempld. list:—Sec. Lt. D. Jones, Jan. 7th; Sec. Lt. F. P. Regan, Jan. 27th; Sec. Lt. F. E. Power, Jan. 30th; Lt.-Col. (actg. Col.) R. R. Smith-Barry, A.F.C., Feb. 4th; Lt. G. W. S. Marshall, Feb. 14th; Lt. H. W. Skinner, D.F.C., Feb. 15th; Lt. R. A. Burnard, Feb. 20th; Lt. W. R. W. Burns, Lt. W. P. Scott, Feb. 27th; Lt. F. J. Delamain, Feb. 28th; Sec. Lt. M. G. Church, March 1st; Sec. Lt. C. G. Davies, Lt. P. Robinson, March 6th; Sec. Lt. W. Du Pre Jr., Arthur, Sec. Lt. T. C. Cooper (substituted for notification in "Gazette," March 18th); Lt. C. D. Clarke, March 7th; Lt. R. A. Evans, Sec. Lt. P. G. Troughton, March 8th; Sec. Lt. H. Lurdick, D.F.C., Sec. Lt. G. E. Clifford, Lt. R. Z. Conner, Sec. Lt. C. Hess, March 15th; Sec. Lt. A. A. Baker, Sec. Lt. C. A. Howe, March 25th; Lt. A. D. Pocock, March 28th; Sec. Lt. L. P. Boulder, March 31st; Sec. Lt. N. Barrie, Lt. J. Bedingfield, Sec. Lt. J. F. Stone, Lt. (actg. Capt.) L. Wood, April 1st; Lt. (actg. Capt.) V. D. Siddons, D.F.C., April 3rd; Lt. (actg. Capt.) R. T. Fagan, Lt. H. F. Searle, Sec. Lt. F. L. Smith, April 4th; Sec. Lt. K. C. Whitwell, April 5th; Capt. (actg. Maj.) F. J. E. Feeney, D.S.O., April 6th; Sec. Lt. (Hon. Lt.) F. Godson, D.F.C., Lt. J. K. Hardy, Lt. H. Sacre, Lt. J. G. Stevenson, April 8th; Lt. A. C. Kent (Norfolk Yeo.), Sec. Lt. W. T. Capt. E. B. Waller, Lt. R. Whitehead, Sec. Lt. H. Woodcock, Sec. Lt. F. H. Snoxell, Sec. Lt. W. Steel, April 9th; Sec. Lt. E. E. Salmon, April 10th; Sec. Lt. G. F. Gander, Sec. Lt. S. E. Grand, Capt. E. Pownall, Sec. Lt. A. Paveley, Lt. (actg. Capt.) C. A. F. Whitley, April 11th; Lt. K. W. D. Pope, Lt. L. E. Swan, April 12th; Lt. L. A. Fanning, Lt. V. O. Hazeldine, Sec. Lt. W. Hall, Sec. Lt. M. J. Poulton, Sec. Lt. F. E. Power, Sec. Lt. J. M. Porteous, Sec. Lt. A. B. Porter, April 13th; Lt. H. A. E. Gard, D.F.C., Sec. Lt. H. K. Scrivener, Sec. Lt. J. L. Stephenson, Sec. Lt. (Hon. Lt.) E. M. C. Shipp, April 14th; Sec. Lt. E. R. Heartz, Lt. S. C. M. Pontin, Sec. Lt. H. T. Saver, Sec. Lt. F. W. Skelton, Lt. H. St. J. Swan, Lt. (actg. Capt.) A. Welsh, Sec. Lt. R. L. Williams, April 15th; Lt. B. W. Robinson, April 16th; Lt. L. D. Henderson, Lt. A. W. B. Singer (Sco. Rif., T.F.), Sec. Lt. E. G. Welsby, Lt. R. V. Walker, Lt. A. R. Wilkie, April 17th; Lt. H. E. Pohlmann, Sec. Lt. D. Welsh, Lt. H. A. Yeo, April 18th; Lt. R. C. Berlyn, Sec. Lt. W. T. Booth, Sec. Lt. G. G. Dow, Lt. R. B. Bell, Sec. Lt. R. H. Galloway, Lt. H. Hewson, Sec. Lt. S. E. Henry, Sec. Lt. A. B. Macpherson, Sec. Lt. H. S. McClelland, Sec. Lt. F. N. B. Proctor, Sec. Lt. S. D. Spalding, Sec. Lt. W. H. Wilde, Sec. Lt. L. D. Wright, April 19th; Capt. E. R. H. Pollock, M.C., R.F.A., Sec. Lt. J. S. Shortt, Lt. G. W. Wall, April 20th; Sec. Lt. (Hon. Capt.) G. D. Brewster, M.C., Lt. W. H. Stathaus (Leic. R.), April 21st; Sec. Lt. H. A. Raymond, Sec. Lt. H. A. Raymond-Barker, April 24th; Sec. Lt. A. Dukes, Lt. H. E. Eaton, Lt. J. R. Hembrough, April 25th; Capt. S. Collier, M.C. (Ches. R., T.F.), Lt. A. R. Wardle, April 26th; Sec. Lt. G. Rowell, April 27th; Lt. H. W. Heywood, April 28th; Sec. Lt. R. W. Williss, Sec. Lt. K. Wiggins, April 29th; Lt. T. R. L. Ross (R. Ir. Rif.), Sec. Lt. F. G. Sinclair, Lt. (actg. Capt.) H. R. Verdun, Sec. Lt. F. C. Wells, Lt. (actg. Capt.) R. G. Weller, April 30th; Capt. E. E. Maitland-Heriot, Sec. Lt. J. Simpson, May 1st; Sec. Lt. P. G. Addie, Lt. C. A. Sundy, M.C., Lt. H. T. Townsend, Sec. Lt. G. E. Wright, May 2nd; Sec. Lt. (Hon. Lt.) A. K. Sadler, May 3rd; Lt. W. H. Barlow, Capt. T. H. Stockwood, May 4th; Sec. Lt. L. Sabine, May 5th; Sec. Lt. G. B. Rae, Sec. Lt. R. K. Dickie, Lt. E. P. Sec. Lt. M. Rock, Sec. Lt. G. E. Richmond, Lt. R. S. Warwick, May 6th; Sec. Lt. C. H. Ratcliffe, Lt. T. H. Trew, May 7th; Sec. Lt. W. W. Brown, Sec. Lt. J. L. Dugan, Sec. Lt. A. C. Dutton (R. W. Kent R.), Sec. Lt. A. J. Girardot, Lt. E. E. Macartney, May 8th; Sec. Lt. M. O. I. Griffiths (Suff. R.), Sec. Lt. J. S. Winks, May 9th; Sec. Lt. A. J. McD. Grimston, Sec. Lt. A. R. Morton, May 10th; Sec. Lt. T. Bird, Sec. Lt. R. T. Down, Sec. Lt. R. R. Spencer, Lt. F. E. J. Foxall-Smedley, May 12th; Lt. G. G. Callander, Sec. Lt. S. A. Dilliway, Lt. W. Pallister, May 13th; Sec. Lt. H. Blatcher, Capt. D. B. Cleghorn, Sec. Lt. J. H. Parkinson, Sec. Lt. A. Preston, Sec. Lt. S. F. Wilkin, May 14th; Lt. S. E. A. Bousfield (Sea. Highrs.), Sec. Lt. C. McIver-Campbell, Lt. H. W. Edwards, May 15th; Sec. Lt. E. N. Andrews, Capt. A. R. Cox, Sec. Lt. F. H. V. Fisher, Sec. Lt. S. Meadows, Sec. Lt. L. B. Williams, May 16th; Sec. Lt. H. W. H. Argyle, Sec. Lt. G. B. Boshell, Sec. Lt. (Hon. Lt.) J. H. MacKellar, Sec. Lt. D. McArthur, Lt. S. L. Matthews, Maj. P. J. Powell, M.C., May 17th; Sec. Lt. G. S. Osmond, Sec. Lt. A. Phipps, May 18th; Sec. Lt. C. E. Belanger, Lt. R. S. Greig, Lt. F. J. Ortweiler, Sec. Lt. H. E. Pople, Sec. Lt. H. Machon, Sec. Lt. H. F. Michiels, Sec. Lt. C. Macmillan, Sec. Lt. C. E. O'Grady, Sec. Lt. V. O'Neill, Sec. Lt. W. Penhall, Sec. Lt. T. B. Patterson, Lt. C. St. C. Parsons, Sec. Lt. A. W. Palmer, Capt. J. Robinson, D.F.C., Sec. Lt. H. E. Sullivan, Sec. Lt. W. R. Spittel, Lt. W. C. Seymour, May 20th; Sec. Lt. A. S. Ball, Sec. Lt. V. A. Brabant, Sec. Lt. P. S. Brown, Sec. Lt. C. H. Main, Lt. F. G. Pool, May 22nd; Sec. Lt. E. E. Dabee, Sec. Lt. J. C. Dereuno, Sec. Lt. L. P. J. Dion, Lt. T. C. Farquhar, Lt. F. F. Gifford, Maj. V. Nicholl, D.S.O., May 23rd; Lt. L. G. Candy, May 26th; Sec. Lt. J. W. Mettam, May 28th; Lt. C. L. Frank, Sec. Lt. J. W. Gravell, Sec. Lt. W. G. Millar, May 29th.

Lt. (actg. Capt.) H. E. Winter relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Capt., May 21st.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—C. Packham, May 14th; J. F.

Drake, D.F.C., E. N. A. Kemington, R. F. Round, May 20th; J. H. McClure (caused by wounds), May 21st.

Lt. J. R. MacMillan (Sask. R.) relinquishes his commn. on account of ill-health, April 9th.

Lt. H. J. Leavitt resigns his commn., May 21st.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—J. Duncan, J. W. Marshall (contracted on active service), H. B. Mills, May 20th.

R. W. Rollinson (contracted on active service), May 21st.

Sec. Lt. A. Graham to take rank and prec. as if his appt. as Sec. Lt. bore date Aug. 22nd, 1918.

Sec. Lt. W. Smith (commd. March 14th, 1918) is cashiered by sentence of a General Court Martial, March 12th.

Sec. Lt. G. J. N. Norman is dismissed the Service by sertence of a General Court Martial, April 14th.

The rank of Lt. J. M. Bacon is as now described, and not as stated in "Gazette," April 1st.

The initials of Lt. C. H. Clifford are as now described, and not as stated in "Gazette," May 2nd.

The surname of Col. G. C. St. P. De Dombasle is as now described, and not as stated in "Gazette," May 16th.

The initials of Lt. C. S. L. Coulson, D.F.C., are as now described, and not as stated in "Gazette," April 15th.

The notification in "Gazette," March 18th, concerning Lt. E. T. Collins, is cancelled.

The notification in "Gazette," March 25th, concerning Sec. Lt. A. J. Jones, is cancelled.

The notification in "Gazette," April 1st, concerning Lt. B. N. Willis, is cancelled.

The notification in "Gazette," April 4th, concerning Sec. Lt. N. V. Scott (S. Staffs. R.), is cancelled.

The notification in "Gazette," April 8th, concerning Lt. J. F. Drake, is cancelled.

The notification in "Gazette," April 25th, concerning Lt. W. G. Roberts, is cancelled.

The notification in "Gazette," April 29th, concerning Lt. R. A. Burnand, M.C., is cancelled.

ADMINISTRATIVE BRANCH.—H. C. Jones (Capt., Midd'x R.) is granted a temp. commn. as Capt., Sept. 12th, 1918, with seny. from April 1st, 1918.

To be actg. Capts. whilst empld. as Capts. :—Lt. W. H. D. Phillips, from Feb. 27th to April 30th; Sec. Lt. E. U. Poyser, from March 1st to April 3rd.

Lts. to be graded for purposes of pay and allowances as Capts. whilst empld. as Capts. :—J. M. J. C. J. I. Rock, W. H. D. Phillips, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances of Capts. whilst empld. as Capts. :—H. Baker, E. G. Burden, E. Codyre, and to be Hon. Capt., J. N. Dillon, F. T. Dixon, W. A. Glasper, A. E. H. Hales, A. H. Hasler, R. W. Johnson, G. A. McMillan, and to be Hon. Lt. J. H. Slingsby, G. E. L. Woodhouse, and to be Hon. Lt., May 1st.

Sec. Lt. L. Marquard to be graded for purposes of pay and allowances of Capt. whilst empld. as Educational Officer, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Capts. whilst empld. as P.T. Officers :—G. P. Abbott, A. J. Adams, S. D. Harrower, P. W. Smith, C. Wilson, and to be Hon. Lt., May 1st.

Lts. (A.) to be Lts. :—N. S. Cameron, C. S. L. Coulson, D.F.C., D. P. Farley, K. L. Mackenzie, April 17th; G. F. Hunter, J. M. Johnson, May 6th; F. W. Dogherty, May 10th; J. E. W. Sugden, May 12th; L. Mortimore, May 13th.

Lts. (O.) to be Lts. :—C. Flavell, April 17th; F. J. B. Hammersley, May 7th.

Sec. Lts. to be Lts. :—(Hon. Lt.) E. L. Ridley, May 20th; H. T. Joy, Feb. 28th (substituted for notification in "Gazette," April 25th); L. M. Britten, April 23rd.

T. T. Coates (Capt. and Qr.-Mr., Spec. List) is granted a temp. commn. as Lt., April 1st, 1918, and to be Hon. Capt.

Sec. Lt. F. H. H. Twelvetree to be actg. Lt. whilst empld. as Lt., from (T.), from Sept. 16th, 1918, to April 30th.

Sec. Lts. to be Sec. Lts., from (T.) :—(Hon. Lt.) J. F. Alexander, May 1st, and to be graded for purposes of pay and allowances as Capt. whilst empld. as Capt. :—A. T. Robson, May 13th.

The following relinquish their commns. on ceasing to be empld. :—Lt. W. S. Hann (Lt., R. Horse Gds.), March 24th; Lt. (actg. Capt.) P. J. Gething, M.C. (Lt., R.A.S.C.), May 20th.

Transferred to unempld. list :—Lt. (actg. Capt.) C. F. Upton, Feb. 8th (substituted for notification in "Gazette," April 1st); Capt. (actg. Maj.) C. J. Page, Feb. 10th; Sec. Lt. J. P. Wotton, March 4th; Sec. Lt. D. J. Tarling, March 5th; Lt. R. E. Coppinger, March 15th; Sec. Lt. M. R. de Saxe, April 10th; Sec. Lt. (Hon. Lt.) (actg. Lt.) C. Kenyon, Sec. Lt. A. C. Schofield, Sec. Lt. W. Swanney, Lt. B. Strange (Line. Yeo., T.F.), April 11th; Lt. A. B. Pocock, Lt. H. E. Waters, April 12th; Sec. Lt. S. A. Garfath, April 14th; Sec. Lt. M. J. Hemmer, Sec. Lt. (actg. Lt.) S. S. Vanderhook, Lt. N. C. Yonge, April 16th; Capt. H. A. Shinn, April 18th; Lt. J. H. Pollitt, April 25th; Sec. Lt. (Hon. Lt.) (actg. Lt.) H. L. Webley, April 28th; Capt. C. W. Pollock, April 30th; Sec. Lt. (actg. Lt.) F. R. Whittaker, April 30th; Lt. F. E. Rossclli, Lt. (Hon. Capt.) W. H. Kelley, May 1st; Sec. Lt. D. Beaumont, Sec. Lt. P. W. Gibbs, May 4th; Lt. W. H. Savery, May 7th; Sec. Lt. G. R. Dunworth, Sec. Lt. H. F. Green (R. Fus.), May 8th; Sec. Lt. L. H. Seccombe, May 10th; Lt. A. R. Porter, Capt. H. V. Robinson, May 13th; Lt. H. G. Burgess, May 14th; Capt. A. Gye, Sec. Lt. A. P. Steer, May 17th; Capt. E. F. Monk, Sec. Lt. W. C. Marshall, May 18th; Sec. Lt. T. B. McMillan, Sec. Lt. H. H. Newman, Lt. A. P. Prior, May 20th; Lt. L. H. B. Price, M.C., May 21st; Lt. G. R. Priestley, May 24th; Sec. Lt. W. G. Merrick, Lt. A. T. Packman, Lt. J. L. Probit, May 29th.

The notification in "Gazette," April 8th, concerning Lt. C. A. Howe, is cancelled.

The notifications in "Gazette," May 2nd, concerning the undermentioned officers are cancelled :—Lt. C. H. Clifford, Capt. (actg. Maj.) H. W. Morgan, Lt. (actg. Capt.) B. Turner, Lt. H. B. Turner

TECHNICAL BRANCH.—To be actg. Majs. while empld. as Majs., Grade (A) :—Capt. W. H. Dolphin, from March 11th to April 30th; Lt. (actg. Capt.) F. Susans, from Nov. 26th, 1918, to April 30th.

Lt. (actg. Capt.) B. Turner retains the actg. rank of Capt. whilst empld. as Chemical Warfare and Explosives Expl. Officer from March 29th, to April 30th.

Sec. Lt. (actg. Capt.) J. H. Lytle retains his actg. rank whilst empld. as Capt., Grade (B), from (Ad.), from Nov. 9th, 1918, to April 30th.

Lt. C. F. Blunt to be actg. Capt. whilst empld. as Capt., Grade (A), from Dec. 17th, 1918, to April 30th.

Lt. J. A. Atkinson to be actg. Capt. whilst empld. as Capt., Grade (B), from June 1st, 1918, to April 30th.

Sec. Lt. J. A. Atkinson to be actg. Capt. whilst empld. as Capt., Grade (A), from Dec. 10th, 1918, to April 30th.

Sec. Lt. J. A. F. Henderson to be actg. Capt. whilst empld. as Capt., Grade (B), from (Ad.), from May 30th, 1918, to April 30th (substituted for notification in "Gazette," Aug. 30th, 1918.

Lt. H. A. Adams to be Lt., Grade (B), from (S.O.), May 12th.

Sec. Lts. to be Lts. :—Hon. Capt. H. M. Eldridge, M.C., and to retain his hon. rank, Nov. 1st, 1918 (substituted for notification in "Gazette," March 7th); L. A. Gwen, April 2nd.

A. Hunnings (temp. Lt., K.R.R.C.) is granted a temp. commn. as Sec. Lt., Grade (A), April 1st, 1918, and to be Hon. Lt.

Lt. E. H. Wilson (Lt., Notts and Derby R.) relinquishes his commn. on ceasing to be empld., April 10th.

Transferred to unempld. list :—Capt. A. Lord Kennedy, Feb. 4th; Sec. Lt. G. R. Wills, Feb. 8th; Lt. J. A. H. O'Hynes, Feb. 13th; Capt. H. S. Smith, Feb. 14th; Capt. W. A. Seed, March 6th; Maj. K. Secratan, March 30th; Capt. J. E. Haswell, April 1st; Sec. Lt. F. S. Wallis, April 2nd; Sec. Lt. (Hon. Lt.) (actg. Lt.) E. L. Pollard, M.C., April 4th; Lt. L. D. Brown, April 8th; Capt. T. M. Dutton, April 9th; Lt. R. A. Webster, April 12th; Sec. Lt. H. Powell, April 15th; Sec. Lt. B. Haynes, Sec. Lt. J. J. Wilson, April 16th; Sec. Lt. A. M. Carroll, Sec. Lt. A. A. Pollitt, April 19th; Lt. (actg. Capt.) H. J. Poole, Lt. S. Power, Sec. Lt. (Hon. Lt.) M. McC. Warwood, April 22nd; Sec. Lt. (Hon. Lt.) (actg. Capt.) A. Ward, Capt. A. W. F. Smith, April 29th; Lt. A. W. Barbow, April 30th; Lt. F. G. Buck, May 1st; Sec. Lt. A. J. Bright, May 3rd; Sec. Lt. W. W. Brabner, Sec. Lt. C. Henderson, Sec. Lt. P. B. Slade (Lond. R., T.F.), Lt. A. G. D. West, May 6th; Capt. D. S. W. Haubly, May 7th; Lt. S. E. Tucker (Manch. R., T.F.), May 8th; Capt. A. Graves (R.E., T.F.), Capt. G. H. Moir, Sec. Lt. R. A. Silk, May 9th; Sec. Lt. (Hon. Lt.) H. J. Dixon, May 12th; Lt. R. J. Martin, May 13th; Sec. Lt. H. W. Dunk (Lond. Yeo.) Capt. A. F. C. Pollard, May 15th; Lt. J. E. H. Swain, May 16th; Lt. A. Milner, Capt. W. Sillem, May 17th; Sec. Lt. N. Openshaw, May 18th; Capt. C. P. H. Gunyon, May 19th; Sec. Lt. (Hon. Lt.) S. Field, Lt. A. E. Reynolds, May 20th, Sec. Lt. (Hon. Lt.) L. Marsh, May 21st; Capt. J. G. Mallett, May 24th.

Maj. H. R. Vagg to take rank and precedence as if appointment as Maj. bore date Feb. 5th.

The rank of Lt. M. G. Fountain is as now described, and not Sec. Lt. as stated in "Gazette," April 25th.

The notification in "Gazette," Jan. 28th, concerning Sec. Lt. R. Wylie is cancelled.

The notifications in "Gazette," Feb. 11th, concerning the undermentioned Officers are cancelled :—Lt. J. A. Atkinson, Sec. Lt. J. A. Atkinson.

The notification in "Gazette," March 4th, concerning Sec. Lt. G. Colbert is cancelled.

The notification in "Gazette," April 11th, concerning Lt. W. E. Phillips is cancelled

MEDICAL BRANCH.—Transferred to unempld. list :—Capt. W. B. Dove, Feb. 21st; Capt. R. C. Fitzgerald, M.C. (R.A.M.C.), April 2nd.

MEMORANDA.—The following are granted the actg. rank stated against their names, with effect from May 1st (substituted for notification in "Gazette," May 27th) :—To be actg. Cols. : —Lt.-Col. A. D. Cunningham, while empld. in the Airships Department, Admiralty; Lt.-Col. B. H. O. Armstrong, C.M.G., while empld. as Director of Inland Works; Lt.-Col. T. D. Mackie, C.M.G., O.B.E., while empld as Director of Air Construction Service.

Sec. Lt. (Hon. Lt.) T. Sutherland is granted the hon. rank of Capt., Oct. 20th, 1918.

The following cadets are granted hon. commns. as Sec. Lts. :—330738 R. G. Mitchell, Feb. 5th; 305874 R. A. Bolton, Feb. 17th; 766576 H. Valentine, Feb. 18th; 9/93567 J. Keane, 117918 A. E. Piddock, 128688 G. Richards, Feb. 19th; 162 S. L. Gladstone, Feb. 24th, 3813 R. C. Hill, Feb. 25th; 472206 N. S. C. Elmslie, P. J. Woolf, Feb. 27th; 128508 A. Bott, 137324 G. W. Dicker, 175851 H. Fenton, 101530 A. F. Hall, 137246 C. M. McLaughlan, 117331 N. Sykes, 133013 A. Wilson, March 3rd; G/7866 F. C. Clark, 172458 H. Edwards, 60112 H. Gerrard, 12313 H. F. Gibson, 115164 P. Hamson, 93130 W. C. Hunt, 176239 F. S. Hughes, 176096 W. P. Janes, 175633 E. K. Jarman, 241668 J. W. Kuypers, 116676 C. Law, 21473 W. R. Lewis, 52712 C. A. Mackenzie, 110860 J. L. Mathers, 517010 R. Richings, 117927 R. A. Seaton, 1230 A. R. Whyte, March 11th; 117555 J. Bain, March 14th; 3/9150 C. A. Bax, 175443 W. G. Davies, 8/11574 C. H. R. Parfitt, March 17th; 117651 R. W. Barclay, 221496 C. S. Crouch, 950141 H. A. Crowch, 137185 W. H. Diggins, 175851 C. E. Ebrall, 217906 H. J. Green, 117979 R. W. Holyfield, 1513 L. R. Morgan, 220777 J. F. Reilly, 225788 R. S. Trebilcock, 137049 A. R. N. Wilkinson, March 18th; 175420 R. J. Asquith, 88625 F. G. Licence, March 19th; 123750 F. A. Barnes, 132671 H. D. Best, 256416 T. H. Boffey, 76774 A. Brown, 11766 C. C. Cullen, 222240 W. E. Clegg, 30539 W. R. Harris, 96181 A. E. Jepson, M2/679139 D. McInnes, 128307 G. A. A. Robins, March 21st; 394950 E. H. Page, March 22nd; M2/52660 T. W. Edkins, 136921 C. H. Robertson-Green, 195708 W. Smith, March 28th; 137193 F. C. Eckford, 3403 W. Fohn, March 29th; 137148 H. M. Brodie, March 31st; P.F.O. 4 L. J. Farnett, 86677 A. T. Blake, 37601 R. Clark, 117909 H. M. McKeller, 92913 C. C. Wood, April 1st; 324508 S. Causen, 50866 G. Craven, 40021 G. Harris, 117830 E. Thompson, April 2nd; 137161 K. Cheesman, 38920 L. A. Dixon, 7368 W. Frisby, 119104 F. Treville, April 3rd; 17620r G. W. Adams, 55426 W. Barrow, 76773 V. E. Baker, 276079 J. A. Beauchop, 1010656 G. P. Barnett, 492162 A. W. L. Carper, 36154 N. H. A. Clark, 52854 W. F. Currie, 137552 D. Darnborough, 21550 J. O. Griffiths, 93134 A. T. McWilliams, 403880 H. S. Redhead, 6278 L. F. L. Sammons, 110580 E. R. Spurrier, 100112 H. M. Stephenson, April 4th; 137162 E. C. Cheesman, April 9th; 76618 A. Bewick, 86898 T. D. Delaney, 133150 G. A. Frenette, 117948 G. Paver, April 10th; 152350 P. Murphy, May 17th.

Col. (actg. Brig.-Gen.) F. L. Festing, C.M.G., relinquishes his commn. on ceasing to be empld., and is permitted to retain the rank of Brig.-Gen., June 1st.

Transferred to unempld. list :—Lt. C. S. Downey (R.A.O.C.), from S.O., March 28th, Maj. (actg. Lt.-Col.) M. Freeman, O.B.E. (Worc. R.), from (S.O.), May 1st; Lt. (actg. Maj.) H. Lee, (S.O.), May 14th; Sec. Lt. (actg. Capt.) E. F. Page, from (S.O.), May 16th.

The notification in "Gazette," May 13th, concerning Capt. C. W. C. Browne, is cancelled.

The notification in "Gazette," May 16th, concerning Lt. Col. (actg Brig.-Gen.) C. L. N. Newall, C.M.G., A.M., is cancelled.

ST. JAMES'S PALACE, June 2nd.

The King has been pleased on the occasion of His Majesty's Birthday to approve of the following appointment :—

Capt. His Royal Highness Prince Albert Frederick Arthur George, K.G., Royal Air Force, to be a Personal Aide-de-Camp to the King.

The King has been pleased, on the occasion of His Majesty's Birthday, to give orders for the following appointment to the Most Excellent Order of the British Empire, in recognition of services in connection with the war :—

K.B.E. (MILITARY DIVISION).

Rear-Adm. C. L. Vaughan-Lee, C.B.

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, May 28th.

Mr. Harry Hawker and Commander Kenneth Mackenzie-Grieve, R.N., had the honour of being received by the King, when His Majesty decorated them with the Air Force Cross.

BUCKINGHAM PALACE, May 29th.

The following were severally introduced into the presence of His Majesty, when The King invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted :—

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE (MILITARY DIVISION).—COMMANDER.—Col. James Horne, R.A.F.

OFFICERS (Military Division)—Lieut.-Col. William Fernie, R.A.F., and Capt. Norman Gilchrist, late R.A.F.

His Majesty then conferred decorations as follows :—

THE MILITARY CROSS.—Capt. George Riley, R.A.F.; Lieut. John Walkerdine, R.A.F.; Second Lieut. Arthur Tearn, N. Staffs. Regt., attd. R.A.F.

BUCKINGHAM PALACE, May 31st.

The King held an investiture in the Quadrangle of the Palace at eleven o'clock this morning.

The following were severally introduced into the presence of The King, when His Majesty invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted :—

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE (Military Division).—Commanders.—Lieut.-Col. Martin Flack, R.A.F., and Lieut.-Col. Harold Moore, R.A.F.

THE DISTINGUISHED SERVICE ORDER AND THE MILITARY CROSS.—Lieut.-Col. Edward Tennant, R.A.F.

The King then conferred decorations as follows :—

BAR TO THE DISTINGUISHED SERVICE CROSS.—Capt. Euan Dickson, R.A.F.

THE DISTINGUISHED SERVICE CROSS.—Capt. Gilbert Nelson, R.A.F.

THE MILITARY CROSS.—Lieut. Charles Robson, R.A.F.

OFFICIAL COMMUNIQUES.

The following communiqué was issued by the India Office on May 28th :—

On May 24th Jelalabad was again effectively bombed, and large portions of the military part of the town are reported to be burnt out.

On May 24th our aeroplanes bombed the powder factory and fort of Kabul. A large explosion was observed.

The India Office states that the following further information has been received from the Government of India :—

Up to May 24th the general situation remained unchanged, and the tribal attitude good.

On the Mohmand border our aeroplanes in this area were fired on by small Afghan guns.

The following communique was issued by the India Office on May 30th :—

During the air raid on Kabul on May 24th bodies of troops, estimated at 5,000 to 6,000 were observed, mostly moving westward, between Gandamak (28 miles south-west of Jalalabad) and Kabul.

The India Office made the following announcement on June 1st :—

The latest information received from Simla, dated May 29th-30th, shows that all the Afghan attacks on our fort at Thal (Kurram Valley) have been repulsed.

An air reconnaissance disclosed 3,000 to 3,500 enemy near Thal. Bombs were dropped on their camps with good effect.

The India Office issued the following on June 2nd :—

The arrival of our aeroplanes at Miramshah, in Waziristan, is reported to have eased the local situation as regards the tribesmen in the neighbourhood.

ADMIRALTY APPOINTMENTS.

The following appointments have been made :—

MAY 27th.—Lieut.—R. J. R. Langmaid, to "Argus."

MAY 31st.—Royal Naval Reserve.—Temp. Lieuts.—L. Beard, to "Empress," May 30th; and S. Myers, to "Benbow." May 29th, and to "Ark Royal," undated.

THE CASUALTY LIST.

AIR FORCE

Reported May 28th.

KILLED.—Cartwright, Lt. J. W. P., R.A.F.
Hayne, Capt. E. T., R.A.F.
Thornhill, Lt. A. G., R.A.F.

DIED OF INJURIES.—Warman, Capt. C. W., D.S.O., M.C., R.A.F.
Norton, Lt. G., R.A.F.

DROWNED.—Evans, Lt. L. L. M., R.A.F.
Stokes, Lt. H. J. E., R.A.F.

PERSONAL NOTICES.

NAVAL.

BIRTHS.

FOWLER.—On May 30th, at Belhurst, Hurstmonceaux, the wife of Major F. B. Fowler, late R.A.F. and Sqdn. Comdr., R.N.A.S.—a daughter.

MARIX.—On May 24th, at Elces, Chigwell, Essex, the wife of Major R. L. Marix, D.S.O., R.A.F. (late Sqd.-Cdr., R.N.A.S.), of a son.

ENGAGEMENT.

FANE—BACON.—The engagement is announced between Captain Gerard Fane, D.S.C., R.A.F., son of Mr. Sidney Fane and Mrs. Fane, and Rhoda, daughter of Mr. and Mrs. Nicholas Bacon, of Raveningham Hall, Norwich.

MILITARY.

DEATHS.

CHISNALL.—Lieut. Charles Alain Chisnall, R.A.F., 21st Canadian Reserve, who died on May 29th at Ripon, was the youngest and only surviving son of Mr. and Mrs. C. H. Chisnall, Frating Abbey, Colchester.

DUNN.—Capt. Frederick Dunn, R.A.F., the pilot of the Tarrant Triplane, which was wrecked during trials on May 26th, died from his injuries in Cambridge Hospital, Aldershot on May 28th. He never regained consciousness after the accident, his skull and spine being fractured.

Captain Dunn, along with Messrs. Carr, Lilywhite, Barrs and others from the Hendon aerodrome, went off the day war was declared and enlisted in the Royal Flying Corps, like the good sportsmen they were. They were promptly accepted as N.C.O. pilots, and all did good service at the Front.

Captain Dunne, after a strenuous period of war-flying, was given a commission for service in the field, and after a period came home, and was detailed for test work for the R.F.C. at Farnborough, a position for which his long experience of flying at home and on active service fitted him excellently. In due time he was promoted to Captain, R.F.C.

He was a splendid example of the keen and energetic young aviator who succeeded on his merits in winning promotion. His gallantry during a long period of active service entitled him to the comparative ease of life at home, and the way in which he handled new and experimental machines of all sorts showed that he had in no way lost his flying nerve.

His death is deeply to be regretted, for men of his experience and keenness can ill be spared by those who are working for the further progress of Aeronautics.

ENGAGEMENTS.

ASHMORE—PARSONS.—A marriage has been arranged and will take place in July, between Major-General E. B. Ashmore, C.B., C.M.G., M.V.O., Commandeur de la Légion d'Honneur, commanding the London Air Defences, and Betty, daughter of the Rev. F. W. Parsons, vicar of Tandridge and Rural Dean of Godstone, and Mrs. Parsons.

WHITAKER—SHARP.—The engagement is announced of Captain Raymond Whitaker, the Rifle Brigade and R.A.F., son of Mr. and Mrs. Arthur Whitaker, of 52, Cadogan Square, and Hilda Margaret Sharp, daughter of Lieut.-Colonel and Mrs. G. E. Sharp, of The Close, Salisbury.

BIRTHS.

GORDON-DEAN.—On May 29th, at Hampstead, to Helen, the wife of Major H. Gordon-Dean, York and Lancaster Regt. and R.A.F.—a son.

STAMMERS.—On May 24th, at Royston Lodge, Richmond, Surrey, the wife of Capt. F. G. Stammers, O.B.E., Royal Sussex Regt., and R.A.F., of a daughter.

AIR FORCE.

DEATHS.

HOLLICK.—Lieut. John Hollick, R.A.F., who was officially reported missing in France on May 18th, 1918, is now presumed killed in action on that date. He was the only son of Mr. and Mrs. Thomas Drake Hollick, Little Gaynes, Upminster, Essex, and was 19 years of age.

JACOBI.—Lieut. Edward Sydney Jacobi, R.A.F., who was killed in an aeroplane accident at Aldeburgh on May 24th, was the only son of Mr. and Mrs. Jacobi, of Blackheath.

M'EACHRAN.—Lieutenant Neil M'Eachran, 59th Squadron, R.A.F., who was instantaneously killed on May 20th in a flying accident at Düren, was the eldest son of Mr. and Mrs. Neil A. L. M'Eachran, Homelands, Thorntonhall, Lanarkshire. He was 24 years of age.

WRIGHT.—Cyril V. C. Wright, R.A.F., who died on May 24th, as the result of injuries received in a flying accident at Aldeburgh, was the husband of Laura Wright, Cotmandene, Aldeburgh, Suffolk.

ENGAGEMENTS.

KEMBALL-GIBSON.—The engagement is announced between Captain Stanley Kemball, late R.A.F., and Eileen, youngest daughter of Mr. and Mrs. T. S. Gibson, of Hillcote, Buckhurst Hill, Essex.

LOVEMORE—EDWARDS.—The engagement is announced of Lieut. R. B. Lovemore, D.S.O., R.A.F., elder son of Mr. and Mrs. W. B. Lovemore, of Swaziland, South Africa, and Miss Gwendolen Amy Edwards, only daughter of Mr. and Mrs. H. C. Edwards, of Sussex House, Raynes Park.

MARRIAGES.

ROLFE-ROGERS—MOORE.—On May 29th, at St. Mary's Cathedral, Glasgow, Capt. Ranville George Rolfe-Rogers, R.A.F., son of Mrs. Rolfe-Rogers, Bedford and Ceylon, was married to Katherine Ann Devereux Moore, Acting Administrator, W.R.A.F., eldest daughter of Mr. and Mrs. C. F. Moore, 6, Wilton Crescent, North Kelvinside, Glasgow, by the Very Rev. Provost Ambrose Lethbridge, M.A.

KEMP—SNOW.—The marriage between Capt. W. Kemp,

A.F.C., R.A.F., and Miss Snow took place on June 2nd, at St. Paul's Church, Knightsbridge.

BIRTHS.

MORRIS.—On May 20th, in Galway, the wife of Lieut. A. J. Morris, J.P., R.A.F., of a son.

MOSSOP.—On May 24th, at Bryn, Woodbridge, Suffolk, the wife of Capt. Noel R. Mossop, R.A.F., of a daughter.

WALKER.—On June 1st, at St. John's Wood, the wife of L. A. Walker, M.D., Capt. R.A.F., of 37, Piccadilly—a son.

* * *

It has been stated in a certain section of the Press that Serjt. Aldcock, R.A.F., died in hospital at Aldeburgh as a result of injuries received in a flying accident at Aldringham, Suffolk, on May 24th. This report was issued in error. Serjt. Aldcock has been removed to hospital at Colchester, and is progressing favourably.

FLYING IN AFGHANISTAN.

Apparently, the Afghans do not altogether fancy war in the air, as evidenced by bombing raids upon their towns and troops, and although the official communiqués cover the ground very thoroughly, for those who not only read but understand official communiqués the following extracts from reports of various special correspondents may be of interest.

The "Times" correspondent on May 18th wrote of the fear the Afghans entertain towards aircraft. He says: —

"The interrogation of prisoners emphasises the terrifying effect of air attacks. They were not afraid of rifle fire but were scared by big guns and aeroplanes. They state that 2,000 fighting tribesmen were in Dakka when it was bombed, and there were 100 casualties. Two hundred horses and other animals were killed.

Reuter, on May 18th, writes of the incident of the capture of two Air Force officers mentioned in an official communiqué last week.

On May 17th one aeroplane was forced to descend in the Bazar Valley. Lieuts. Barker and Hoare report that they were well treated by the Zakka Khel. The aeroplanes proceed daily into unknown and dangerous country, where no landing is possible. The machines go off at dawn, and often do not return till dusk. The Afghan abandonment of Dakka was largely due to the fear of aeroplanes. The machines greatly assisted the troops in the recent fighting, machine-gunning and bombing the enemy. They gave prompt information of the arrival of the Afghan levies on our flanks. The wounding by a bomb of the Afghan commander greatly impressed the population. Aeroplanes are dropping thousands of copies of the Viceroy's proclamation on the Jelalabad road.

Reuter is responsible for the two following statements, dated May 21st and May 25th respectively: —

A telegram reporting the aerial attacks of Jelalabad, says these bombing raids have been highly successful. In a night raid Capt. Carbery dropped four small bombs on the Amir's palace. In a day raid four bombs were dropped among 2,000 infantry on parade, inflicting about fifty casualties. The infantry scattered into the barracks, which were bombed in the next raid. Six direct hits were obtained, and all the bombs were dropped in the town, which is much damaged. Fifteen machines took part in the raid, and nearly two tons of bombs were dropped.

Our aeroplanes successfully bombed the munition factories at Kabul, securing seven hits. A large explosion followed. A second raid on Jelalabad was also effective. Several military buildings were damaged and observed to be in flames. The tribal lashkar in the Gandao valley were attacked by aeroplanes, and are reported to have been scattered northwards.

On May 30th, the "Morning Post" summing up the Afghan situation, says: —

"The frontier tribes, despite the attempts of Afghan agents to induce them to come in against the British, are remaining staunch, and there is no doubt that the success of bombing operations from the air has impressed the tribesmen with a salutary fear of the power of British arms.

R.34 IN A FOG.

On May 28th the Clyde-built airship R.34 was formally taken over by the Admiralty, having completed her tests. She left Inchinnan aerodrome for East Fortune the same night. But as the airship approached the East Coast she ran into thick mist, and after passing East Fortune cruised out over the North Sea, where the crew realised they were completely lost. They managed to return to East Fortune, and spent an anxious night over the aerodrome, in the hope that a landing would be possible in the morning. This was impossible, the fog being as bad as ever, and there was nothing for it but to remain aloft. The airship travelled as far as Yorkshire, and as the day wore on the situation of the crew, owing to lack of food and the strain of the protracted journey, became serious. They returned to East Fortune at 3.30 p.m. on May 29th, where, after a good deal of preliminary trouble with mist and wind, Colonel Hicks, the Commander, made a successful landing. General Maitland, Director of Airship Services, was aboard during the cruise.

THE NAVY'S AIRSHIP POLICY.

The Admiralty have under construction three rigid airships, one at the Beardmore Company's works, one at Bedford, and one at the Armstrong-Whitworth Company's works at Barlow, Yorks. These will form part of the fleet of eight airships which the Admiralty has decided to construct.

It is stated that the Admiralty will put these ships onto a regular aerial mail service, which seems a waste of good war material, but would appear to prove that the Admiralty has a greater amout of common sense than the Air Ministry.

THE PRIZE COURT.

The President (Lord Sterndale) on June 2nd, awarded £175 prize bounty to the pilot and air mechanic of H.M. seaplane 9860 for the destruction of the German submarine U.B.32.

Mr. L. F. C. Darby, on behalf of the claimants, read an affidavit by Arthur Edward Ingledew, formerly serving as air mechanic and flight cadet at the Royal Air Force Seaplane Station, Cherbourg, who said that on Aug. 18th, 1917, he was serving on board H.M. seaplane 9860 under the command of Flight Lieut. Charles Stanley Mossop, D.S.C., R.N.A.S., and when he was on patrol about 27 miles north of Cape Barfleur an enemy submarine was seen. The submarine was engaged by the seaplane, and was seen to sink. She was believed to be the U.B.32, and to have carried a crew of 35 hands all told. Lieut. Mossop was killed on active service on Aug. 12th, 1918.

THE ROYAL NAVAL, MILITARY AND AIR FORCE TOURNAMENT

The Royal Naval, Military and Air Force Tournament opens on June 26th. Already rehearsals for the Tournament are taking place on the Rhine, in France, at Woolwich, Aldershot, Deal, Portsmouth, Chatham, Plymouth, Dunblane, etc. The part to be played by the R.A.F. has not yet been announced.

THE MINISTRY ANNOUNCEMENTS.

The undermentioned landing grounds and aerodromes are being relinquished by the R.A.F.: —Orsett (Essex), Greenland Top (Yorks), Benton (Northumberland), Broomfield (Herne Bay, Kent), Dunkeswicke (Yorks), Gilmerton (Edinburgh), Grove Park (Kent), Hedon (Yorks), Horsegate (Durham), Henthorpe Gate (Yorks), Palmers Farm (Essex), Pluckley (Kent), Thornaby (Yorks), Westpole Farm (Herts), Winterton (Yorks).

The landing ground at New Chapel (Surrey) will not be available for a period of two months from May 24th.

ATHLETICS IN THE R.A.F.

Arrangements have been made for a selected R.A.F. Association football team to visit Holland, where it will play two games with representative sides.

The team, which was accompanied by Captain H. Greer, R.A.F., and Captain S. H. Harrower, R.A.F., left England on June 2nd, and will play its first game at Amsterdam on June 5th.

The men chosen to make the tour are: —

F. R. Wood (Millwall); J. Harrow (Chelsea), P. Barton (Tottenham Hotspur); E. Tomkins (Tottenham Hotspur), H. Lane (West Ham), M. Bell (Fulham); F. Adams (Leytonstone), W. Pick (Brentford), F. Norris (West Bromwich), B. Bliss (Tottenham Hotspur), G. J. Fox (Queen's Park Rangers).

Reserves: —G. F. Cannon (Fulham), M. Rist (Milwall), H. Lovesey (Watford), R. Crook (Milwall), R. A. Lindsell (Army).

W.R.A.F. GRATUITIES.

The Air Ministry announces that it is proposed to embody a special provision in the Finance Bill exempting from taxation benefits payable to officers and other ranks of the Women's Royal Air Force. No assessments on these benefits will therefore be made.

GRATUITIES TO POSTAL EMPLOYEES.

It has been decided that officers, warrant officers, non-commissioned officers, and airmen who, as postal servants, were entitled, whilst serving in the Air Force, to their full civil pay, are no longer precluded from receiving the discharge gratuities to which they are otherwise entitled under Articles 490 and 117 of the Royal Warrant for Pay.

This ruling, however, in no way affects the provision in paragraph 10c of Air Ministry Order No. 6 of 1919 excluding warrant officers, non-commissioned officers, and airmen from the war gratuity sanctioned by that order.

ACCIDENTS IN SWEDEN.

Two further fatal accidents to Swedish aviators on German aeroplanes are reported. This, it is stated, brings the total of Swedish fatalities due to aeroplane accidents to 23.

Telegrams: "AEROLITE, MANCHESTER."

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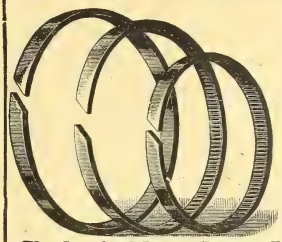
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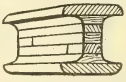
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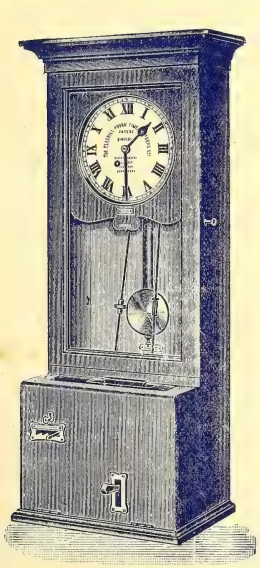
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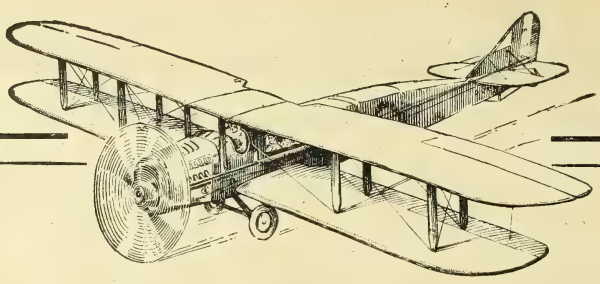
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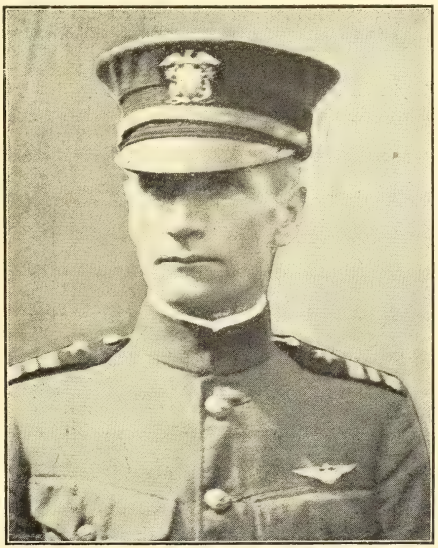
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ON THE DEFEAT OF THE ATLANTIC.

All who are concerned with aeronautics in any form or phase must congratulate the American Nation on the fact that American aviators have defeated the Atlantic Ocean. Naturally we of the British Empire would have preferred that a British aviator should have been the first to succeed in crossing from the New World to the Old by air, but if it could not be one of ourselves we are glad that the honour should belong to those of British race.

Also there is pure poetic justice in the victory being won by the Americans. After all, the first people to fly were the Wright brothers in 1903, on a machine of their own build with an engine of their own make. The first flights off and onto water were made by Glenn Curtiss in 1911, also on a machine and engine of his own production. And the first flying-boat was designed and built by Glenn Curtiss in 1913, again with a home-made engine. Who therefore has a better right to be first across the Atlantic than an American crew on an American flying-boat with American engines? We may regret our own failure, but we cannot grudge America her brilliant success.

Also, although we may regret that the first crossing was not made to the British Isles, there is again poetic justice in the fact that the first journey by air across the Atlantic should be made to that Peninsula whence sailed Christopher Columbus on the voyage which re-discovered America to the civilised world of his day.



Lieut.-Commander A. C. READ, U.S.N., Commanding N.C.4, the first aircraft to cross the Atlantic by air.

The Organisers of Victory.

The American victory was the deserved result of great personal gallantry, great skill in the design, preparation, care and handling of the machine and her engines, and great ability in seamanship and airmanship. But above all it was a triumph of organisation—which is just where we in this country fail so constantly.

Of the gallantry of all concerned there is little need to write. The story of the flight speaks for itself, little as is known of that story up to the present. Nothing could beat the pluck of Commander Towers and the crew of N.C.1, who navigated their boat for 200 miles in the open Atlantic, minus a wing-tip float which had carried away at the start (flying-boat aviators will appreciate the feat at its full value), and fetched up at the end of the first stage under their own power, disdaining assistance proffered by escorting ships. Their fine effort is made finer by the fact that they rode out two gales in the course of their voyage on the water.

The way in which Lieut.-Commander Bellinger and his crew stuck to N.C.3 till she sank is in accord with the best traditions of Naval service.

Nor is there any need to enlarge on the gallantry of Lieut.-Commander Read and his crew, who, after seeing their consorts wrecked and after having covered a World's Record non-stop journey of 1,300 miles, started forth on another 1,000-mile journey entailing equal risks. Be it remembered that though they had a few days in which to overhaul their craft they had no time to make any important replacements, and they took the chance of any internal damage which might have been done by their previous great effort.

The Success of the Pioneer.

It is particularly pleasing to know that Mr. Glenn Curtiss, the pioneer of water-flying, should have had so great a share in this epoch-making event. The initials N.C. stand for Navy Curtiss, the three boats being the joint products of the U.S. Navy and of Mr. Curtiss.

It will be remembered that not only did Glenn Curtiss produce the first flying-boat, but that he built—just before the war—the first multiple-engined flying-boat. This was ordered by Mr. John Wanamaker, the American millionaire, for an attempt on the Atlantic passage. It was built originally at the Curtiss shops at Hammondsport with two Curtiss engines, and tested on Lake Keuka. As it failed to lift a trans-Atlantic load with two engines, a third engine was fitted, and with this additional power it flew fairly well. From it are descended all the big flying-boats of to-day.

The N.C. boats were built in Mr. Glenn Curtiss' own shops at Garden City, Long Island, New York State, where he established himself after his works at Hammondsport and Buffalo were taken over by financiers for pure production. These works, one gathers, now belong to Mr. Willys of the Overland Car, and are without interest to Mr. Curtiss, who continues to be faithful

to his earliest love, the life of a pioneer and experimenter. He is happy in that he has now the money with which to experiment on the grand scale, and the N.C. boats bear witness to his success in his new-old *métier*.

All those who met and learned to like Glenn Curtiss during his all-too-brief visits to Europe, when he won the first Gordon-Bennett race at Reims in 1909, and when he introduced his flying-boat to Europe in 1913, will rejoice in his success. His personal modesty and his self-evident honesty won the highest regard of all who knew him.

The Scientists' Part.

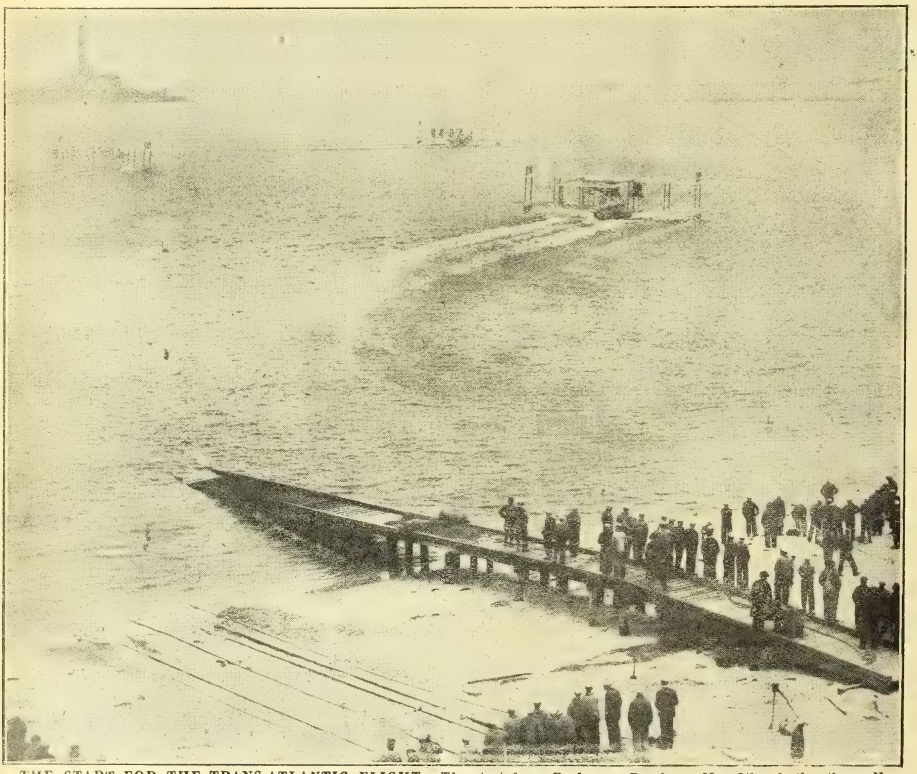
The applied science of aeronautics which has been embodied so well in the N.C. boats is due to certain able young officers of the Department of Naval Construction, one of whom at least, Mr. Jerome Hunsaker, is known to all aeronautical scientists as a pioneer of their particular work. Mr. Hunsaker was recently in England, and, like Mr. Curtiss, he won the esteem of all who met him. He has practical horse sense, as well as a sense of humour in full working order, which relieves his deep and wide scientific knowledge of any charge of being academic. So far as the science of aeronautics goes, Mr. Hunsaker and his coadjutors are in no way behind their European contemporaries, and it is not due to any fault of theirs that Military Aeronautics in the United States proved to be the great wash-out of the War.

It is a lamentable fact that, despite all the newspaper talk about what the American Air Fleet was going to do, not a single American "airplane" crossed the lines during the war. Her brave but unskilled aviators fought and died on second-rate or obsolescent French and British aeroplanes. The history of the combined graft and incompetence which caused this unhappy state of affairs is still being investigated in America, and it will be time enough to tell that story when the truth is known. But it must be set on record here, for the honour of the U.S. Navy, that naval aviation in the United States has been the one bright spot in the sad history of the nation's aeronautical efforts. Which is precisely the opposite to our own case.

The Moving Spirit.

The man who has been the moving spirit in this success is one Commander John Towers, U.S.N. Long before the war Lieut. Towers, as he then was, learned to fly and was known as a first-class pilot. When war broke out he was Extra Naval Attaché at the American Embassy in London.

Though the United States showed no signs of coming into the war, none regarded John Towers as anything other than an Ally, and he was treated as such even by highly placed official personages. Whatever knowledge of Naval aviation was gained while he was in England was known to him, and one believes that his far-sighted and acute mind was of distinct service to us in our early war efforts. If he was not legally an Ally, he was, at any rate, a very friendly neutral.



THE START FOR THE TRANS-ATLANTIC FLIGHT.—The start from Rockaway Beach on May 8th of the three Navy-Curtiss Flying-Boats, N.C 1, N.C.3, and N.C.4.

When he returned to the States, much to the regret of many friends in England, he devoted himself to making the U.S. Naval Air Service the most efficient branch of his country's service. And those who know anything of the work of this arm in the war will be the first to recognise the success of his endeavour.

The U.S. Naval Air Service, unlike the Army's air branch, was excellently organised, well equipped, and well trained, and if the war had lasted only a little longer it would have made itself a big name in bombing over land as well as in operations at sea.

The Work of the U.S. Navy.

When the Armistice came, the U.S.N.A.S. determined to attempt the Atlantic crossing. It had the fullest support of the U.S. Navy, a Service in which, unlike our own, modern ideas find ready reception. The U.S. Navy laid itself out to help the Air Service people, and gave to the Atlantic flight the importance of Naval Manœuvres.

The benefit to the U.S. Fleet of the lessons learned in co-operating with the squadron of N.C. boats scarcely needs explanation. But, for the good of those who still believe in the pre-eminence of the British Navy, it seems worth while to point out that the practice thus obtained in keeping station on the line of flight, in taking signals from and sending signals to seaplanes, in searching for the missing boats, and in general co-operation over such a vast area has given the U.S. Navy experience of a kind which our own Naval people have not had.

The whole business was a triumph of good organisation, and the excellent way in which that organisation worked is evidence of the keenness and efficiency of the U.S. Navy, which deserves every congratulation. One regrets that Commander Towers in N.C.1 was unable to complete his journey by air, but he will be the first to congratulate Lieut.-Commander Read on his success, and he himself may be very well content with the honours which he has won as the man who inspired and organised the defeat of the Atlantic.

An Apology Due.

One feels that an apology is due to the U.S. Navy and to the American people for the indifference or ignorance displayed by the British Press in the matter of America's victory.

The arrival of N.C.4 at Lisbon, which completed the defeat of the Atlantic whether she continued her flight to England or not, was chronicled as a bald fact without comment, and occupied perhaps three or four inches of space in the leading papers. Yet the same papers were devoting columns to descriptions of the hysteria of London's apparently unemployed population over the return of the two British aviators who failed so gallantly to get across.

Probably the American Service people were glad to escape the gush and slush which poured forth so fulsomely over their unfortunate rivals. But one feels that it was at least the duty of the more sound and responsible papers—a duty to the British Public rather than to the American People or the U.S. Navy—to have produced at least a respectable leading article pointing out for the benefit of those who are incapable of thinking for themselves (the vast majority of readers of daily papers) that the Atlantic had suffered its first defeat.

For, be it noted, though it must be a long time before we win the Command of the Air over the Atlantic as we won the Command of the Air over Hunland during the present war, this crossing of the Atlantic by N.C.4 is the first step towards complete ultimate victory in the world-long war which is being waged by man against the so-called elements—earth, air, fire, and water.

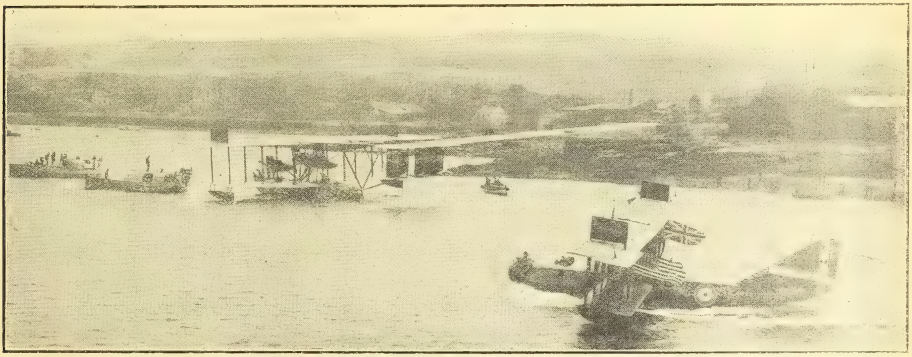
The American Nation must not take the attitude of the British Press as indicating the attitude of the intelligent minority of the British people. Still less does it indicate the attitude of those concerned with British aeronautics. Still less again does it indicate the attitude of the King's Services—which probably count for more than all the rest in the eyes of the U.S. Navy.

Now that N.C.4 has reached England her crew has been overwhelmed with adulation by the British Press—now that the said Press has been reminded of what is expected of it by the people most concerned. But no amount of slopping over can wash out the fact that the British Press did not appreciate the significance of N.C.4's victory when that victory was won.

The Explanation.

America must accept the apologies of the aeronautical section of the British Public, and one would merely ask that the remissness of our Press be set down to pure ignorance and not to malice. It has never occurred to any of our newspaper magnates that the British Public will take the very best of anything as eagerly as it will swallow the very worst. They only know that it is not interested in what is merely clever. Consequently it has never struck any of them to build up a newspaper staff composed entirely of intelligent educated gentleman.

In fact, if one meets a man who is either intelligent, educated, or a gentleman, on the staff of a British Paper, as one does occasionally, one asks oneself what he is doing in this galley. Probably our American friends will understand the situation if this is pointed out to them, for one gathers that the American newspapers



THE END OF THE TRANS-ATLANTIC JOURNEY.—N.C.4 at her moorings in Plymouth Sound, with one of her escort—a British Flying-boat—coming up astern of her.

suffer in much the same way, except that they are not so entirely devoid of intelligence.

One British newspaper man made the excuse, more or less for all the Press, that the crew of the N.C.4 had sold their "story"—as Press slang has it—to an American paper, and refused to tell anything to the journalists at Lisbon. The American paper—according to him—was trying to sell the said story at 500 per cent. profit to any paper that would buy the rights for this country.

The yarn may be true, though one prefers to think that Service reticence prevented the N.C.4s from talking till told to do so by their Navy Department. But even if true in its entirety, there is no excuse for the way in which the whole British Press belittled the flight to Lisbon by simply treating it as an ordinary news item.

The Press which can make nothing out of a great event unless it is accompanied by that species of guff which newspaper men and "movie" people call "heart interest" must be in a pretty poor way. And perhaps we in this country, with our sloppy Teutonic sentiment, have the newspapers and the politicians which we deserve.

Britain's Modest Part.

But perhaps after all we as a nation, in this effete old country, may take upon us a modest share of reflected glory from this great victory. The United States Navy is to a very great extent the direct descendant of the British Navy, and the American people are our blood relations—seeing that the bulk of them are of either British or German descent. Also, they speak the same language, "albeit"—as a humorist has said—"through a different feature."

Further, it may be remembered that, when the first multiple-engined Curtiss boat was a-building for the trans-Atlantic flight in 1914, the pilot was to be a certain Irish ex-lieutenant R.N.—by name John Porte—invalided from His Majesty's Service. Lieut. Porte (now Colonel John Porte, C.M.G., R.A.F.) worked with Glenn Curtiss on that boat, and to him were due—thanks to his knowledge of the sea and to its evil ways—certain improvements in hull-bottoms, which made all the difference to the "unsticking" of the boat from the water.

Those improvements have been developed with later experience, and from that boat descend not only the N.C. boats, but all the "Americas" and Porte Boats and "F" Boats of the R.N.A.S. and the R.A.F. right up to the "Felixstowe Fury," which would herself have flown the Atlantic ere now—as intended by Lord Weir—if the British Navy had had the imagination, the energy, and the initiative of the U.S. Navy.

Also it is worthy to note that, unlike all other existing flying-boats, the N.C. boats do not carry their tails on an elongation of the hull, but on tail-booms, precisely in the manner originated in the Sopwith "Bat-Boats," a type in which one believes firmly, in common with many experienced Naval aviators. Along further modifications of this idea—coupled with Caproni practice—much future development may come. But meantime the "Bat-Boat" influence in the N.C. boats seems fairly obvious.

Lastly, perhaps one may hope that the residence of Commander Towers in this country may have taught him something about Naval aviation which he would not have learned if he had remained in America, and that thus our hard-won early war experience—most of which seems likely to be wasted by an obtuse Naval Administration—may have helped him somewhat in the great task in which he has succeeded so admirably.

If we could not succeed ourselves, we may as well try to make out that some of the credit for success belongs to us.

And Afterwards?

And now what next? The Atlantic has been crossed by air. We have lost the honour of being first across.

There seems to be but a modified glory to be had in being the first to do a non-stop flight. So long as one can get from one place to another in any given vehicle, it matters little whether one stops for a drink on the way or not.

It is probably a recognition of this fact rather than financial or any other considerations which decided Mr. Sopwith in refusing to back Mr. Hawker and Lieut.-Commander Grieve in a second attempt to cross.

After the first non-stop journey we shall begin to introduce an illimitable series of minor classes in the competition. We shall have the "first one-man flight," then we shall have the "first flight with one engine," "the first flight with two engines," "the first flight with four engines," "the first flight with one passenger," "the first flight with ten passengers," "the first flight with fifty passengers," "the first flight with a woman passenger," and so forth and so on, *ad infinitum*.

The thing that really counts is being first across. And that honour has gone to America.

The Commercial Incentive.

But stay! There remains Lord Northcliffe's £10,000 to be won. Here at any rate, though the Glory is departed from Israel, so to speak, we of this country have a commercial incentive to make further attempts. These may be either non-stop efforts, or may include a stop at the Azores for refreshment *à la Americain*.

Doubtless the consequent advertisement will make the attempt worth while, though one doubts whether even the *Daily Mail* will be able to work the whole British people up to the fine full fury of national hysteria which it achieved last week. Nevertheless one wishes well to all who may brave the air and sea in the cause of British Commercial Enterprise.

Our One Consolation.

The great saving consolation to our national honour in this regrettable defeat is that our representatives should have pushed off from the friendly fields of Newfoundland, in spite of adverse weather reports, the moment they heard that their American competitors had reached the Azores. The honour for this act is shared equally by Mr. Raynham and Major Morgan with Mr. Hawker and Lieut.-Commander Grieve.

The fact that Mr. Raynham crashed on the dry land and Mr. Hawker in the wet sea indicates no difference between the physical and moral bravery of the two crews. Both were "ready at their country's call," as it were. And both did their best. One cannot expect that any reward will be given to Mr. Raynham and Major Morgan, for they failed to raise the Nation (*via* the *Daily Mail*) to such a pitch of anxiety as surpassed even that which was felt for our Army in France during the critical days of the Great Retreat, the Battles of Ypres, or the Defeat of March 1918.

Nevertheless in the minds of all thinking people the honour is equally divided, even if the proceeds are not. Such is the fortune of war, and of peace. Mr. Hawker and Lieut.-Commander Grieve have at least earned their £5,000 and their Air Force Crosses—albeit one has been, hitherto, under the impression that the Air Force Cross was intended for officers of the Royal Air Force only, and not for civilian aviators.

If it is to be given to civilian aviators one can indicate at least two or three others who deserve it as well as or better than several of the officers of the R.A.F. on whom it has been conferred. Certainly Mr. Hawker deserves it thoroughly well, if it is to be given to civilians, for his work as a test pilot even before he attempted the Atlantic passage, so that none can grudge it to him in

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spite of the errors of those Members of Parliament—including Major-General Seely, Under-Secretary of State for Air—who referred to him with fine indiscrimination as Major Hawker and Captain Hawker, doubtless confusing him in their limited minds with that gallant officer, the late Major Lanoe Hawker, V.C., D.S.O., who fell a victim to the late Captain Baron Manfred von Richthofen in 1916.

The One British Success.

The only other consolation to our national pride is the fine feat of navigation performed by Lieut.-Commander Grieve. It has always been doubtful whether it was possible to navigate an aeroplane successfully over open sea, but Commander Grieve has now proved the possibility beyond doubt, and under the most adverse circumstances. To him we owe whatever of real tangible value is to be acquired from the flight. One hopes that he will make his methods and his actual work during the voyage known to the aeronautical community. One suggests that a paper by him, written or read to the Royal Aeronautical Society, would be the fit and proper method of imparting this knowledge.

The Ultimate Link.

Still, one swallow does not make a Summer, and one trans-Atlantic flight does not make a commercial air service. We are still far from that regular service of aircraft across the Atlantic which shall be the ultimate link in binding together the two great branches of the Teuto-Latin Races and consolidating them against the Yellow Races. Such a service will come in due time, either by airship or aeroplane, probably by the former at first. But it will only come as the result of regular overland and short-sea services, and not by continuous trans-Atlantic attempts.

When it comes it will depend for its success upon perfect organisation and not upon slap-dash gallantry. So that like the first crossing of the Atlantic it may fall to the skill and organising power of America. If so, as in the present matter, honour be to whom honour is due.

C. G. G.

THE AMERICAN OCEAN-GOING FLYING-BOATS.

By "Austerlitz."

The ocean-going flying-boats which the U.S. Naval Air Service fitted out for the crossing of the Atlantic *via* the Azores belong to the so-called "NC" class of machines, which has been developed by the Curtiss Engineering Corporation at their Garden City works to the designs of the Aircraft Division, Bureau of Construction and Repair, Navy Department. Hence the official designation NC, which stands for Navy-Curtiss, and not for Nonpareil Colossus—as an ingenious-minded individual suggested.

The officers chiefly responsible for the design of the NC boats are Comdr. G. C. Westervelt, Lieut.-Comdr. H. C. Richardson, and Lieut.-Comdr. J. C. Hunsaker, of the Construction Corps, U.S.N.

The Trials of the NC1.

The first of these boats, the NC1, made her initial trial flight on November 8th of last year, when she carried a complement of fifteen from Rockaway Naval Air Station to Washington, D.C., and later in the day flew from the national capital to Hampton Naval Air Station. All those concerned with the construction and operation of the boat were highly elated over these flights, for, despite a certain sluggishness experienced in the take-off, the huge boat proved quite manageable in other respects—not a mean achievement, if one considers that the NC1 (as she was then) weighed, fully loaded, a matter of 11 tons. A high speed of 81 m.p.h. was developed during the trials, and an altitude of 2,000 feet was reached in about 10 minutes.

To Be or Not To Be a Flying-Boat.

As may be seen from the accompanying illustrations, the NC boats divert from customary practice in that the tail surfaces, instead of being fitted to the stern of the hull, are carried on three outriggers, with consequent short-hull construction, which bring us back to the venerable days of the Voisin "Icare," the Sopwith "Batboat," and the Colliex-Janson tandem seaplane.

The object of this construction is to reduce the frictional resistance which a flying-boat develops on the under-side of the hull while taxying to take off, with a consequent slowing down of the starting speed. Now in a rough sea the take-off is in general accompanied by "porpoising"—that is, by striking the crest of each succeeding wave as the boat gathers speed and is already partly supported by the air. This is not only exceedingly uncomfortable for the crew, but also puts the hull to often dangerous strains. Any shortening of the get-away distance is therefore exceedingly desirable for the safe operation of seaplanes, and the short-hull construction appears to answer well this requirement.

Unfortunately, owing to its smaller excess of flotation, it introduces a certain longitudinal instability when afloat, and affords less protection to the tail group than a long-hull flying-boat. This explains why on small flying-boats the short-hull construction has not found great favour thus far.

Owing to their type of construction, the NC boats are often referred to as a compromise between the boat and float type seaplanes, although, were a precise definition wanted, a flying-boat may be described as a sea-going aeroplane which affords accommodation to the crew in a hull ensuring flotation. Consequently long and short hull seaplanes may both be considered as flying-boats "pure and simple."

Physiognomy and Anatomy.

The hull of the NC1 has an overall length of 44 ft. 8¾ ins., a beam of 10 ft., and an overall height of 7 ft. 5½ ins. It is of the straight V-bottom type, with a single step located 18 ft. 2 ins. from the stem. Unlike the Felixstowe and the American F boats, the NC1 has no fins flaring out on either board, but is nearly semi-circular in cross section.

The hull is built up around a keel and four longerons of white ash, with veneer bulkheads; keelson and stringers are of basswood. The planking is composed of an inner skin of Port Orford cedar, placed at right angles to the keel so as to act as a strength member, and an outer skin of Spanish cedar, with Courtrai fabric laid in marine glue in between, and secured to one another by brass nails. The step is reinforced by mahogany veneer.

The wings are composed of a centre section of 25 ft. 4 ins. span and outer sections of 44 ft. 4 ins. (upper) and 35 ft. 4 ins. (lower) span, with a uniform chord of 12 ft. Including the balanced portion of the ailerons, the span of the upper wings is 126 ft., and that of the lower wings 96 ft.; the interplane gap is 13 ft. 6 ins. at the centre section, whence it decreases towards the tips to 12 ft. because the lower outer sections are set at a dihedral of 3 deg. The angle of incidence of both wings is 3 deg.; there is no stagger or sweep-back.

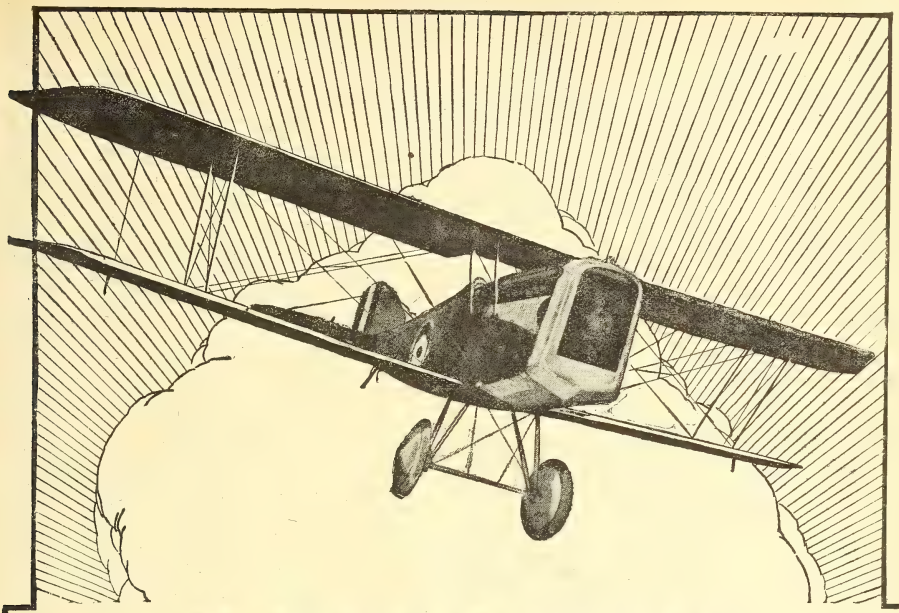
Ten bays of interplane struts secure the wings to one another; six of these occur in the centre section, where they serve in pairs as engine supports. Where the outermost interplane bays abut against the *cellule*, a vertical drift plane is fitted to the upper wing, and a streamline balancing float is secured to the lower wing. The *cellule* is extensively trussed by swaged wires.

The power plant consists of three Liberty-12 engines of the low-compression Navy type, which develop each 330 h.p. at 1,590 r.p.m., and actuate a four-bladed tractor airscrew of 10 ft. 10 ins. diameter by direct drive. The engines are mounted in streamline *nacelles*, which are secured to the inter-bays of the centre section; the centre engine *nacelle* is fitted with a cockpit for a mechanic, to which access is had from the boat by means of a scaling ladder.

The outriggers which carry the tail unit are of hollow spruce and form a pyramid-like structure, the base of which is attached to the upper rear wing spars and the stern of the hull, while the truncated apex affords the points of attachment of the biplane tail. The latter is composed of an upper tail plane of 47 ft. 11 ins. span, and a lower tail plane of 26 ft. span, set at a gap of 9 ft. 3 ins., to which are hinged balanced elevators. Three rudders are fitted in the tail *cellule;* the central is balanced, but the outer rudders are hinged to a vertical fin.

The Crews.

The normal complement of the NC1 consists of five officers and sailors, two of the officers being pilots; these are seated side-by-side in a cockpit fitted amidships and provided with dual control and the necessary instruments. A gunner's nest is fitted in the bows, and another was originally provided for in the middle of the upper wings, with access through the



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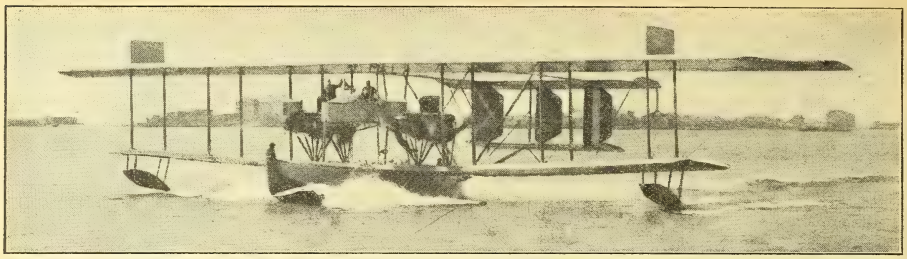
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THE NON-STARTER.—N.C.2, which differed from the rest of the series and was not used—for reasons given below.

centre engine nacelle; the wing gun emplacement has, however, been removed, in view of the attempt to cross the Atlantic.

The fuel tanks contain about 300 American gallons of petrol, which is sufficient for a continuous flight of 13 hours. The disposable load is 7,750 lbs., and the full flying weight 21,560 lbs.

A More Powerful Sister.

When, to quote a Presidential proclamation, "the war came to an end" with the signing of the Armistice, the Navy people at once made extensive plans to carry off the palm of the first crossing of the Atlantic. With the experience gained in the operation of the NC1, three more boats of this class, but of an improved type, were laid down at the Curtiss works in Garden City, L.I., and Comdr. John H. Towers, U.S.N., the veteran American naval flyer, was ordered by the Navy Department to take charge of the organisation of the ocean flight. At the same time Rockaway Naval Air Station was designated as the American starting-place of the flight.

The second of the NC boats, NC2, made her maiden flight on April 12th, at Rockaway. Except for her power plant, which consists of four Liberty-12 engines arranged in tandem sets, with each set driving tractor and pusher airscrews, and the fitting of a pilot nacelle in the place where the NC1 had her central engine, the new boat is identical with her older sister.

The wing area is the same in the two boats—2,380 sq. ft.—but the NC2 has shown in trials to have a loading efficiency of 47 per cent. as against 36.4 per cent. for the NC 1, although, owing to her fourth engine, the power loading of the NC2 is only 17.9 lbs./h.p., as compared with the 22.2 lbs./h.p. of the NC1.

It is true that as a consequence of the greater load carried—28,500 lbs. in flying trim—the wing loading has jumped from 9.1 to 12 lbs./sq. ft., an unusually high figure, judged by contemporary standards.

During her initial trials the NC2 took off after a 35 seconds' run (7 seconds better than the best performance of the NC1), and developed a high speed of 95 m.p.h., but both tests were made in "light" condition.

Since then the boat has lifted a total weight of 28,500 lbs., of which, it was believed, about 11,500 would be available in fuel for the trans-Atlantic flight.

However, the NC2 was not destined to participate in the grand adventure. Among the reasons given for this decision of those in power is the belief that the tandem arrangement of the engines is not conducive to best efficiency, because the pushers work in the slip-stream of the tractors, while the operation of machine with both engines of either board cut out also appears a somewhat questionable proposition. Finally it is realised that the pilot nacelle unnecessarily increases head resistance, while certain misgivings are felt with regard to the advisability of having a worn-out pilot climb down the scaling ladder with a wind of 90 m.p.h. doing its utmost to blow him off.

The Rebuilt NC1.

Consequently it was decided that the NC2 should shed her wings, or rather the outer sections, so they might be fitted to the NC1, which had her wings damaged by a storm, and that the power plant of the latter boat should be modified to conform to the practice followed in the NC3.

The latter, which made her maiden flight on April 23rd, was fitted with three tractor airscrews, with engines arranged as in the NC1, but had besides a fourth engine, actuating a pusher, mounted tandem fashion with the central engine. This arrangement is believed to permit a much more efficient utilisation of the power plant, as airscrew interference can in the worse case extend to only one of the power units, while the possibility of an offsided pull is reduced from one-half to one-third.

This was well brought out during the initial flight of the NC3, marked by the antics of the starboard engine, which balked, despite the most strenuous efforts of the crew.

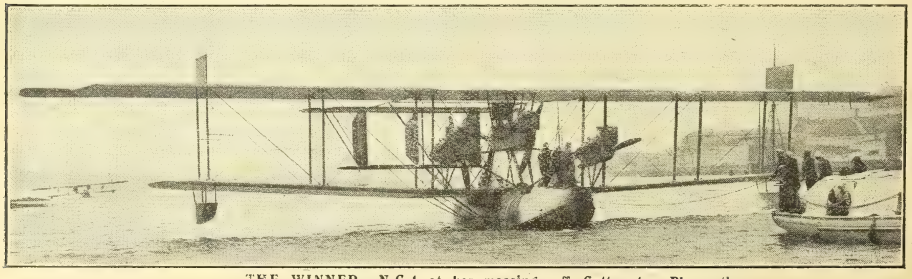
In spite of this handicap, the NC3 displayed great stability (in light condition it is true) during her trials, and great satisfaction was felt by the Navy people over this vindication of their views. Afterwards the NC3 was given a 2-hour sea trial, with a total weight of 29,500 lbs., for the purpose of testing her seaworthiness; this appears to have come off quite satisfactorily.

The NC4 was being assembled at the date of writing, and was expected to be put through her acceptance tests very shortly. With the latter completed, the three boats were to constitute NC Seaplane Division 1, which would attempt to cross the Atlantic under the order of Comdr. Towers. Among the officers named in naval circles as pilots of the boats were Lieut.-Commanders Read, Bellinger, and Mitscher, and Lieuts. McCullough, Barin, and Hinton.

Other Preparations.

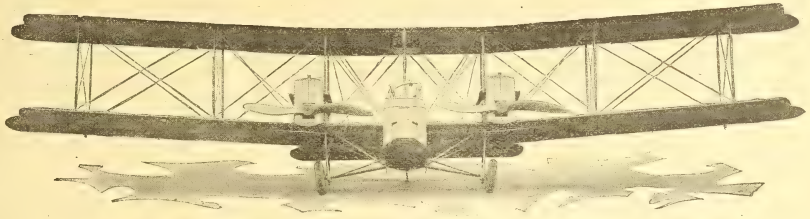
Shore parties of mechanics and sailors were sent to Trepassey Harbour, N.F., Horta (Azores), and Lisbon, to establish air stations. NC Seaplane Division 1 flew the so-called Southern course—that is, by way of Newfoundland, the Azores, and Portugal. There was 940 land miles from Rockaway to Trepassey Harbour, thence 1,230 miles to Horta, and 950 miles from there to Lisbon. The American boats did not follow the Northern or direct route, because their fuel tanks have insufficient reserve capacity for this purpose.

All three boats were equipped with radio direction finders and wireless sending and receiving instruments as well as with flame and smoke flares, which were to be dropped *en route* to ascertain the drift and permit due correction in the course.

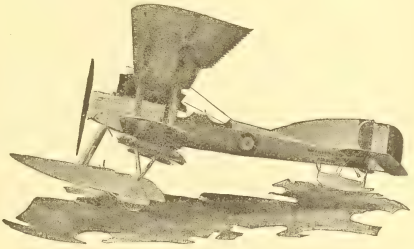


THE WINNER.—N.C.4 at her moorings off Cattewater, Plymouth.

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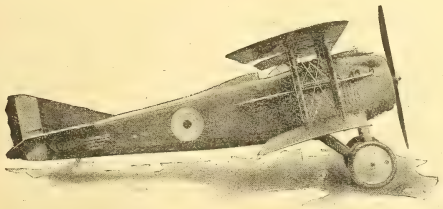
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THE REAL LESSON OF THE TRANS-ATLANTIC ATTEMPT.

By Capt. W. H. SAYERS, (late) R.A.F.

The wave of popular enthusiasm which has swept over this country on the occasion of Mr. Hawker's attempt to fly the Atlantic has obviously little to do with the actual nature of the achievement.

Regarded as an aeroplane performance, Mr. Hawker's flight of 1,200 odd miles in 12 odd hours cannot be compared in importance with his own flight of 8 hours 23 minutes at Brooklands on October 24th, 1912.

That was at least an achievement which put British-built aircraft and aero-engines amongst those which counted.

As a sporting event, Mr. Hawker's effort was undoubtedly a fine thing. There was no risk that the Americans would wrest the "Daily Mail" prize from him, and his action in starting under relatively unfavourable conditions can only have been dictated by the desire to be the first across.

This is why the British public has let itself go over Hawker.

The average Englishman has no ill-feeling towards his American cousins. He is properly grateful to them for the very great assistance they have afforded in the final stages of the great war, but he is, if anything, a little tired of the talk of a certain section of the American people whose main occupation recently has been that of boasting of the ultimate effect that the American methods of organisation would have had had the war lasted.

Therefore Hawker and Grieve's lone-hand effort to defeat the U.S.A. Navy's attempt won a certain added sympathy over and above that which would anyhow have been extended to anyone who took the risks they were taking.

Mostly, however, the demonstration must be traced to the desire to let themselves go over some really sporting achievement totally divorced from the associations of four and a half years of war.

On the whole, it is probably a healthy sign as to the state of mind of the British public.

But there is a grave danger that this attitude may lead to forgetfulness of the one really important aspect of this unsuccessful attempt at crossing the Atlantic.

As has already been suggested, neither the distance covered nor the duration of the flight is of any great importance as an aeroplane performance, or as a feat of endurance on the part of the pilot.

That any serious breakdown of the engine on this particular flight would place both pilot and passenger in grave danger is a tribute to their confidence in their machine and their audacity, but it has no serious practical significance.

But the fact that the flight was carried out over sea, with no fixed landmarks to serve as guides, relying entirely upon instrumental observation on the part of the navigator to keep to the correct course, and that the methods adopted did in fact prove successful is a matter of the very gravest importance.

The successful development of practical methods of aerial navigation is one of the most difficult of the problems to be solved in connection with the future of aerial transport.

Lieut.-Commander Mackenzie-Grieve has shown that even under very trying weather conditions it is possible to navigate an aeroplane across sea with the aid of instrumental observations with quite unexpected accuracy.

Commander Grieve is, of course, an experienced navigator, but he certainly can have no very large experience of this particular type of navigation.

One is without any definite information as to the type of instruments which he used for his observations, but it is known that very little has yet been accomplished in the direction of developing special navigation appliances for aeroplane use.

It is therefore reasonable to suppose that what Commander Grieve was able to accomplish on this occasion, with no accumulated experience of air navigation behind him, and with relatively crude appliances, will be possible for any decently trained aerial navigator within the next few years.

Purely as a step in the development of the aeroplane as a vehicle, Commander Grieve's work far outdistances in importance anything that now or ever will be accomplished by any mere flyer who simply flies a machine over vast distances.

This is spoken in no disparagement of the pilots of to-day, least of all of Mr. Hawker. They have done their work, frequently at a risk even more imminent and deadly than those faced to-day in an attempt to cross the Atlantic, in proving that the aeroplane is a practical mechanism.

But it is now the turn of the navigator, and it is for him, now that it is an ascertained fact that an aeroplane can fly, to show that he can direct it accurately to its intended destination.

The very fact that of the three American machines which attempted the Newfoundland-Azores flight, two having arrived within 200 miles of their destination were entirely unable to find it on account of fog, and that the successful N.C.4, after a run of 170 miles in fog, found herself 45 miles off her course is a very fair index of the importance of the navigator's art.

It is gratifying to note that this point has not passed altogether unheeded.

In a long letter to the "Times," published on Saturday, May 31st, Lieut.-Col. H. T. A. Bosanquet, late R.A.F., draws the attention of the general public to this aspect of the matter, and the following extracts therefrom are worthy of attention:—

"Before another trans-Atlantic flight is attempted by the direct route, may I be allowed space to draw attention to the navigational side of the venture? It appears, from the very secondary importance and credit that have been given to the navigator, that the general public has failed to grasp the overwhelming importance of correct navigation and its manifold difficulties in such a flight.

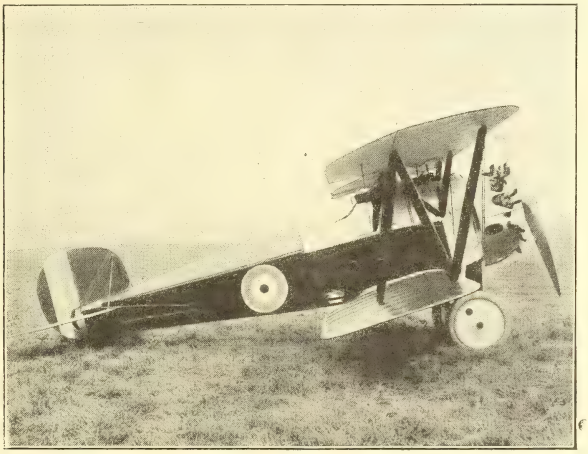
"The affair has merely been regarded as a sporting event somewhat similar to, but on a larger scale than, the first cross-Channel flight. The two things are not, however, comparable. . . . The trans-Atlantic venture is on a totally different plane, and for accomplishment calls for the highest technical skill and practical experience on the part of the navigator. Whereas it might be possible at this moment to pick out at least one thousand pilots from the R.A.F. qualified in skill, physical endurance, and courage to undertake this flight, on the other hand it is probable that the really competent navigators, possessing the technical navigating knowledge, combined with the equally necessary practical experience of long over-sea flights, could be reckoned on the fingers of one hand.

"It may be well to indicate some of the difficulties of the direct route from St. John's to Ireland. The distance is about 2,000 land miles, and if the objective is to be safely reached the aircraft should be able to fix her position, more or less correctly, at intervals of not more than one hour or about every 100 miles—bearing in mind that an initial error of only 5 deg., if persisted

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in, would result in putting the craft some 150 miles to either side at the end of her run.

"There are three general methods of fixing positions (a) dead reckoning; (b) directional wireless; (c) astronomical observations, and in their present stage of development at least two of these should be available if the voyage is not to be one of pure hazard.

"As for the first, this depends entirely on the accurate determination of the drift and the speed of the craft over the earth's surface. When flying over land, especially at heights under 6,000 ft., some fairly accurate passages can be made, but in over-sea navigation, whether flying high or low, the most extraordinary errors can be made. . . . A good example is furnished by the U.S. N.C.4, which, on her way to the Azores, ran into fog and had to depend on her D.R. calculations for some 170 miles. When her position was again established by one of the route-marking vessels she was 45 miles out in her reckoning. In the Sopwith flight, Lieut.-Commander Mackenzie-Grieve found himself by astronomical observations about 150 miles off his course in a run of 900 miles. When such large errors are possible it is easy to see that any dependence on this method is out of the question.

"Directional wireless is still in its infancy. It has given the most promising results, and undoubtedly will be the method of air navigation in the future, but it is not yet sufficiently developed to be reliable. . . .

"Astronomical observations can be carried out from an aircraft as on board a seagoing craft, but with much greater difficulty and less accuracy. The sea horizon is not available, so that a cloud horizon must be used or an instrument having its own artificial horizon. Up to the present no really satisfactory instrument of the latter type has been designed, and the use of the cloud horizon is not always possible. Moreover, these observations in an aircraft demand a high degree of skill and practical experience on the part of the observer. So that it is only an exceptional man, and one who has long practised observing under difficult conditions at sea, who can make any real use of this method.

"Hence it becomes necessary to fall back on D.R. as the main principle, and naval expert opinion at the Air Ministry, certainly until quite recently, was to the effect that a trans-Atlantic flight dependent on this method only would be a highly hazardous undertaking. . . .

"One of these essentials is that the skill, knowledge, and experience of the navigator should be above suspicion. . . . I suggest that it is now the duty of the Air Ministry, as the Government Department most nearly concerned, to make careful inquiry into the credentials of the navigator in each case in this trans-oceanic business. Both the Admiralty and the Board of Trade allow no vessels coming under their respective departments to proceed overseas without a fully qualified navigator on board, who has been able to satisfy a board of examiners as to his knowledge and practical experience. Why should not the same be the rule for an oversea aerial voyage? . . ."

THE PEACE TERMS TO AUSTRIA.

The following are among the terms presented to Austria by the Allies :—

PART V.

AIR CLAUSES.

The Air clauses provide that the armed forces of Austria must not include any military or naval air forces. The entire personnel of the air forces in Austria is to be demobilised within two months.

The aircraft of the Allied and Associated Powers are to enjoy full liberty of passage and landing over and in Austrian territory until January 1st, 1923, unless prior to that date Austria is admitted to the League of Nations or is permitted to adhere to the International Air Convention.

The manufacture of aircraft and parts of aircraft is forbidden for six months.

All military and naval aircraft (including dirigible and aeronautical material) are to be delivered to the Allied and Associated Governments within three months.

PART XI.

AERIAL NAVIGATION.

Aircraft of the Allied and Associated Powers shall have full liberty of passage and landing over and in Austrian territory, equal treatment with Austrian aeroplanes as to use of Austrian aerodromes, and with most-favoured-nation aeroplanes as to internal commercial traffic in Austria. Austria agrees to accept Allied certificates of nationality, airworthiness, or competency and licences, and to apply the convention relative to Aerial Navigation concluded between the Allied and Associated Powers to her own aircraft over her own territory. These rules apply until 1923, unless Austria has since been admitted to the League of Nations or to the above Convention.

AN ACCIDENT TO LORD LONDONDERRY.

Lord Londonderry and Brig.-General Vyvyan, R.A.F., met with an accident on May 31st while flying from Tadcaster to London. Both escaped with a severe shaking, but Lord Londonderry was able to catch a train for London the same day.

The machine, a Bristol Fighter, piloted by Gen. Vyvyan, was compelled to land at Charlton, Selby. The landing was made in a boggy field and the machine charged a fence, part of which was carried away, turning the aeroplane into a dyke.

CONGRATULATIONS.

In its proper place in the Military Column appears the official announcement of the engagement of Major-General E. B. Ashmore, C.B., C.M.G., M.V.O., to Miss Betty Parsons.

All who are concerned with the Royal Air Force and with Aeronautics will join in congratulating General Ashmore on this happy event, and will wish him and his bride-to-be an amount of happiness equal to that which General Ashmore himself has conferred on the inhabitants of London and the adjoining counties by his able command of the London Air Defence Area. Probably if the aggregate amount which he has conferred on some millions of people is divided up between the two it will suffice very comfortably for any two human lifetimes.

A DESERVED HONOUR.

The "London Gazette" of June 2nd announces that the King has been pleased on the occasion of His Majesty's Birthday to approve of the honour of Knight Bachelor being conferred on the following gentleman :—

Charles Bright, Esq., F.R.S.E., M.Inst.C.E.

Sir Charles Bright will be remembered as a most active member of the Air Inquiry Committee of 1916, when his auxiliary report brought to light a number of important points on which the Government afterwards took the necessary action. He also made numerous suggestions which were evidently of use to the Civil Aerial Transport Committee of 1917.

Sir Charles is one of the earliest members of the Royal Aeronautical Society, and is the son of Sir Charles Bright, the brilliant engineer, who was responsible for the laying of the first trans-Atlantic cable. All will be glad to see this honour conferred upon him as a reward for his good work in the cause of aviation in general and of the R.F.C. in particular.

A SOUND APPOINTMENT.

One notes with pleasure the fact that Major C. C. Turner, A.F.R.Ae.S. (late R.A.F.), has been appointed Editor of that old-established journal, "Aeronautics."

Major Turner was known for years before the war as the writer of a weekly column of aeronautical notes in the "Observer" at a time when the general public cared but little for aviation and when the British Press cared less. His articles were always well written, his opinions were always sound, and his information was always reliable.

One wishes him every success in his new undertaking, and one congratulates the proprietors of "Aeronautics" on having secured so able an Editor for their paper—which, if one is not mistaken, is the oldest of all existing aeronautical periodical publications.

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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

On Dollars and Dimples.

An American technical journal which supplies a weekly review of everything from dimples to dope, publishes the following :—

"Dorothy Dalton, whose dimples and smiles have charmed millions in Thomas H. Ince productions for Paramount pictures, achieved the distinction of being the first lady passenger to travel by hydro-aeroplane from Keyport, N.J., to Albany, N.Y.

"Miss Dalton and her pilot, C. J. Zimmerman, came near making the world's record for slow flying. This, however, was because whenever Miss Dalton spied anybody down on the ground who looked as if he had the price, she would alight and sell him a Victory Loan bond."

One wonders at what altitude Miss Dalton flew in order to see which one of her intended victims "looked as if he had the price."

As, presumably, the hydro-aeroplane could only alight on water, one wonders if the plutocrats were bathing, in which case it appears that it would have been difficult to discriminate between the dollared and the undollared, unless the modern American munitioneer wears a fur collar on his bathing costume.

Or did she bring the dimples and smiles that have charmed millions to bear on yachtsmen only? One would like to know more.

The Gravity of the R.33.

The "Daily Mail" stated last week that :—

"One of the largest airships in the world rose from her moorings at the Barlow Works, Selby, and started on an eight-hour experimental cruise in ideal weather yesterday. She was the R.33, of whom so much is expected.

"The ascent was made without a hitch.

"At the last moment, when the ship was off the ground, the commanding officer called for more ballast, and two agile navvies clambered up the ropes in fine style, in this way restoring the gravity of the vessel to proportionate terms."

One wonders what the writer means exactly by "restoring the gravity of the vessel to proportionate terms." Does he imply that the sight of the agile navvies clambering up the ropes made it indulge in unseemly levity?

In a Chastened Spirit.

According to the "Daily Chronicle," a fantastic letter, addressed to a sober Government department, was read last night by Mr. H. Pike Pease, M.P., at the annual dinner of the Head Postmasters' Association.

The letter, from a munition-making firm, was addressed to the Ministry of Munitions, and stated :—

During this great war we have done many things that aforetime we had considered almost impossible. We have turned our ploughshares into swords, made night into day, made bricks without straw, turned water into wine, and ale into compound for the refreshing of labour.

We have resurrected machine tools, and taught them to rise and sing; we have imported proud Americans, we have salvaged destitute Belgians.

We have gathered in and utilised barbers, circus proprietors, aboriginals from the Antipodes and some of the "Best People."

We have made women into mechanics and mechanics into supermen such as may be found at the Ministry of Munitions. We have diluted our labour, both male and female, until we have workers of the combined sex and of neither sex.

We have honoured the King and strafed his enemies, but we stand to-day hopelessly cast down by your suggestion that we should cut 2-inch Module pitch aeroplane engine gear with 2½-inch Module cutter.

The original letter was published in THE AEROPLANE something like two years ago, but it is well worth publishing again, if only to acknowledge on behalf of Mr. Pike Pease the source of his humour.

Style.

The following is an example of how not to advertise :—

> "Pilot with more than five years' experience both here and abroad, wishes position as pilot for private or liable factory. I have flown over 50,000 miles, in the daytime and at night."

It reminds one of Smith Minor, who wrote : "Mr. Smith presents his compliments to Tom Brown, Esq., and informs you I cannot accept his kind invitation as I have another I like better."

And, by the way, what is a "liable" factory?

A Freak Wedding.

A wedding in an aeroplane was celebrated on May 31st at Houston (Texas). Lieut. W. R. Meade and Miss Marjorie Dumont were married in a Handley Page machine 2,000 feet in the air.

A wedding party of 12, including the Rev. J. E. Rees, who performed the ceremony, flew in the machine.

One may now expect a new series of height records. The American bride who was married at an altitude of 2,000 feet will find herself eclipsed by another who is so anxious to have her name and photograph in the papers that she will modestly retire to a height of 18,000 feet above the clouds that form her wedding veil. An enraged parent endeavouring to forbid the banns from a pursuing Camel would add to the piquancy of the situation.

One so often finds reason to criticise the daily newspapers that one feels that in justice one must give credit to the journalists who refrained from the obvious comment on matches being made in Heaven.

Mimic Fighters.

According to an American general, "Fifty thousand persons watched the great mimic battles in Van Cortlandt Park, getting the most thrilling and vivid picture of how and why the Hindenburg line crumbled under the pressure of American fighters.

"One thrilling incident was when an observation balloon was sent up two thousand feet to report the 'enemy' doings and fire from the 'enemy' hit the envelope and set the balloon afire. Instantly its pilot was seen to jump off the basket, and as he did a large parachute opened up and carried Lieutenant Herbert H. Mills, of the 22nd Balloon Company, safely to the ground. This was the signal for the afternoon battle to start."

One is not told what happened to the pilot while the large parachute was carrying off Lieutenant Herbert H. Mills.

As to the mimic "pressure of American fighters," one has no doubt that it was wonderfully realistic.

"917."

"Nine one seven," 'tis the end;
Never more will you and I
Fly together, ancient friend,
Under clear or cloudy sky.
Comes a wetness to the eye,
In the throat a rising lump,
As I think how destiny
Sends you to the Salvage Dump.

Many a patch and cobbled rent,
Many an honourable scar,
Marks your might in tournament,
Vindicates your worth in war:
Flying fast and flying far
You have seen both friend and foe
Hurtle like a falling star
Twenty thousand feet below.

Not for you the splendid fate,
Mortal blow in mid career
And a death immediate,
Sudden and too swift for fear;
Days when danger was most dear,
Hours with glorious living crammed—
You survive and linger here
As "Unserviceable" damned.

You who spurned the upper air
And outpaced the wind in speed,
Now must follow wheresoe'er
Leyland lorry wheels may lead.
Humbled, like some warrior steed,
Bugle music in his heart,
Who, grown old and totter-kneed,
Ends upon the butcher's cart.

Clipped the wings that eaglewise
Bore you strongly up of old,
And your prop dismantled lies
And your cylinders are cold.
Yet in some far sky, I hold,
There's an aerobatic Heaven
Where, with joystick uncontrolled,
Stunts your spirit, Nine One Seven.

H. T. BURT.

TRANS-ATLANTIC FLIGHT.

The

Sopwith Rolls-Royce Biplane

used by

Mr. H. G. HAWKER

and Lieut.-Commander

MACKENZIE GRIEVE, R.N.

in their great attempt

was doped with

CELLON

(Scheme "A")

The WORLD of AERONAUTICS (continued)

Another Turbine, One Presumes.

According to a South African newspaper, "a Johannesburg engineer, Mr. E. P. M. Jerrard, claims to have invented a type of engine that will serve both as an aeroplane and a motor engine, and that will, if necessary, perform 40,000 revolutions per minute.

"One of the advantages of this invention is that, owing to its construction, when used for flying machines, it will enable the machine to lift itself vertically in the air without the usual running start, and also descend vertically to rest upon a pre-determined spot very little larger than itself.

"The great speed of this engine is adaptable for direct drive of the propellers, which are designed to revolve effectively at such speed, so that the dead-weight lifting power is more a matter of the power of the engines than of the shape or size of the wings, planes or aerostats."

One wonders what kind of airscrew would withstand the strain of being driven at the rate of 40,000 revolutions per minute It would have to be of very small diameter, and one would imagine that it would be very inefficient.

In the matter of revolutions this engine certainly has Russia and the South American republics beaten to a frazzle.

Exclusive Information.

The "Daily Mail" recently referred to the Alliance-Napier "Seabird" as follows:—

"Fitted with a 40-h.p. engine, giving a speed of 140 miles an hour, the 'Seabird' is expected to cross the Atlantic in about 12 hours."

Apparently this engine must be a Napier "Lion" cub.

Regarding the time in which it is expected that the crossing will be made, an expert mathematician calculates that, if the "Seabird" flies at a speed of 140 m.p.h. for 12 hours, she will travel 1,680 miles, just 260 miles short of the distance from Newfoundland to Ireland, which is shown as 1,880 miles on the map published in the "Daily Mail."

This proves once more how misleading are figures, for the "Daily Mail" must, of course, have inside information, which is indicated by the fact that no other newspaper has yet mentioned the 40-h.p. "Lion" cub.

The Leeds Exhibition.

Lord Londonderry, in opening the R.A.F. Aircraft Exhibition at Roundway Park, Leeds, on May 31st, said that the activities of the Air Ministry with regard to exhibitions must necessarily come to an end. If aviation was to make progress in the future it must be on commercial lines. It was felt that the Government had no right to interfere with those firms who were anxious to extend their activities in developing the industry on sound commercial lines. Thus, so far as exhibitions were concerned, that at Leeds would be the swan-song. And very justly so.

The Royal Aeronautical Society.

The Society attained its Jubilee in the year 1916, but in consequence of the War it was at the time inadvisable to celebrate the event in any way. The end of the War, however, the fact that the Society has by command of His Majesty been dignified by the prefix of "Royal" and the fact that the Society has attained a membership of 1,000 and more, has determined the Council to mark the occasion by a gathering of its members and their friends.

By the kind permission of Mr. Handley Page a Garden Party will be held on the Cricklewood Aerodrome on Sunday afternoon, June 29th, from 4.0 p.m. to 7 p.m. Arrangements are being made for the entertainment and interest of those present.

The programme will include an exhibition of flying, opportunities for guests present to take flights, and an exhibit of various new types of machines. Handley Page, Limited, have kindly placed their works on view, and the Band of the Royal Air Force will be engaged for the occasion.

All applications for tickets must be made before June 19th to the Secretary, the Royal Aeronautical Society, 7, Albemarle Street, Piccadilly, W.1. The charge for admission, including tea, is 3s. for each person.

Flying Races at the London Aerodrome.

An interesting programme has been arranged by the Grahame-White Company at the London Aerodrome, Hendon, for the Whitsun Holidays.

Race Meetings will be held on Saturday and Bank Holiday, and it is interesting to note that this will be the first occasion, after a break of five years, on which Aerial Races have been held in England.

The course will consist of a series of circuits from the London Aerodrome to a point about two miles away; the machines will, therefore, be in full view of the spectators the whole time.

It is expected that there will be a large number of entries from the manufacturing firms who have been making machines during the war. Details of the races and prizes, etc., may be had upon application to the London Aerodrome (telephone—Kingsbury 120), where entries are being taken.

In addition to the races interesting displays on all types of machines will be given by pilots (late R.A.F.), and another feature will be parachute descents from machines travelling at over 100 miles per hour

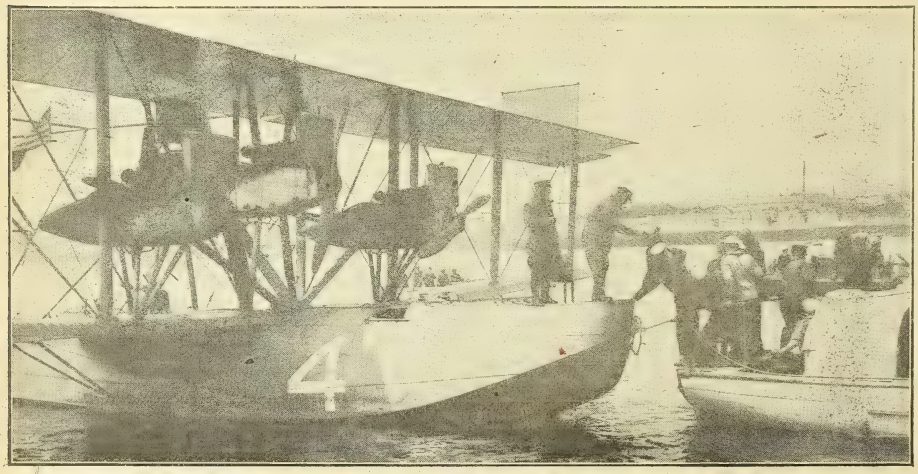
The Band of the R.A.F. will play from 3.30 p.m. until 7 p.m. on Saturday, Sunday and Whit Monday.

Speed.

The "Times" of May 26th published the following:—

Capt. Alcock, the Vimy pilot, lent his mechanics to Mr. Raynham to help in rebuilding the Raymor, and the Vimy, it is expected, will be allowed to fly from the Handley Page aerodrome. The day before the start it may fly light to Harbour Grace, fill up, and take off from there. This aerodrome is practically on the edge of the cliffs, and in a few seconds the machines will be over the ocean with the nearest land nearly 2,000 miles away.

The performances of a machine that can fly two thousand miles from its starting point in a few seconds will be worth watching.



The N.C.4 at Cattewater after her successful trans-Atlantic Flight. The arrangement of the four engines is interesting.

JOIN NOW

THE

CENTRAL AIRCRAFT COMPANY'S

SCHOOL of AVIATION

under the personal supervision and management of

Mr. Herbert Sykes, O.B.E.

THE WELL-KNOWN TEST AND EXHIBITION PILOT

assisted by a large staff of qualified and experienced instructors.

Tuition on 75 H.P.

DUAL CONTROL "C.A.C." Tractor Biplanes,

the Finest Training Machines yet produced.

Applications for particulars as to Enrolment, etc., should be made to:—

The CENTRAL AIRCRAFT Company

179, High Road, Kilburn, N.W. 6.

The WORLD of AERONAUTICS (continued)

An R.N.A.S. Dinner.

A dinner for officers who served at the R.N. Air Station, Eastbourne, in 1915 and 1916, will be held in London on Saturday, July 12th, 1919. Those wishing to attend should communicate before June 20th with Capt. H. S. Neville, Room 239, Air Ministry, enclosing two guineas for expenses.

A Volunteer Reserve Air Force.

Sir,—I have read recently with great interest, in THE AEROPLANE, the letter concerning the Voluntary Air Reserve Force, and I, an Englishman of the French Foreign Legion, who has had three years' flying experience as a war pilot, would willingly be a member of the V.R.A.F.

I think, like most sensible persons, that it is of the utmost importance to have a strong Reserve Force, for we must keep in mind this old and very true motto:—

"To preserve Peace, be prepared for War!"

Hoping that many AEROPLANE readers will support the above proposition. R. COLLINS.

In Aid of the Airmen's Relief Fund.

On Wednesday, June 11th, at three p.m. and eight p.m., a musical entertainment will be given in the Working Men's Club, Ingatestone, in aid of the Airmen's Relief Fund. A canteen comedy in two acts, by Miss C. M. Jennings, entitled "Poached Eggs and Pearls," will also be played.

The entertainment is under the distinguished patronage of the Lady Petre, Audry the Lady Petre, Mrs. S. H. Petre, and Miss Agnes Petre, and, among others, Major H. Petre, D.S.O., M.C., R.A.F., and Capt. W. Petre, R.A.F.

Tickets, price (afternoon) 3s. 6d., 2s. 6d., and 1s., (evening) 3s., 2s., and 6d., may be obtained from Mrs. S. H. Petre, Tor Bryan, Ingatestone, and Mr. Percy Greenfield, The Clock House, Ingatestone.

"Contact" and "Klaxon" Again.

The June "Blackwood's Magazine," published a few days since, contains the first instalment of "Eastern Nights and Flights," by "Contact" (Capt. Alan Bott, M.C.).

"Blackwood's" is well known for the high standard of its material, and after the rubbish which—written by those who claim to know something of aeronautics—it has been one's fate to read lately, it is with relief that one turns to such an unfailing writer as "Contact."

Judging merely by the first instalment, "Contact" has lost none of his charm of writing during his period of captivity, and one fell at once under the spell of the writer of "An Airman's Outings."

Among the other writers in this month's "Blackwood's" is "Klaxon," who is giving at some length the extremely interesting story of H.M. submarines.—S. F. B.

Fury at Felixstowe.

The following letter has been received:—

Sir,—Early last year a portion of the Felixstowe Air Station, both material and personnel, was reserved for the purpose of building the "Fury," with a view to flying the Atlantic from Newfoundland *via* the Azores to Europe.

Everything went well, and after the Armistice a large proportion of the men engaged on the project volunteered to remain and finish the boat instead of "demobbing," and a number of those, about thirty in all, agreed to go to Newfoundland and re-erect the machine.

This shows that there was plenty of enthusiasm, as we were working day and night on her to get the "bus" ready for the big trial flight. During the last few months the boat has, as you doubtless know, done wonderfully well and is fit to put a ring round the world and, to quote Col. Porte's own words, "reflects great credit on all concerned."

Since the last long trial a few weeks ago new engines (low compression) have been fitted, and now comes the first instance of red tape in which we are entangled. A new mid-ship propeller was necessary. This took about five weeks to order, because the Treasury would not grant the expenditure involved. Even so, they are paying millions per week on tomfoolery in other ways, and I am sure the taxpayers would not begrudge £30 or £40 extra for the honour of making the country's attempt successful.

At the same time, the Navy refused to carry the boat to Newfoundland, as they had no "finger in the pie," notwithstanding the fact that all the officers and men were old R.N.A.S. people. So it was decided to fly from this side. Now for the crowning insult to all of us who stood by to see her finished. The Right Hon. Winston Churchill refuses to sanction the Atlantic flight and makes the miserable excuse that private firms should have the first chance, and this after all the time and money that has been spent in designing and building the most successful seaplane in existence. FURIOUS.

The Dutch Aircraft Exhibition.

A visit of inspection was made by representatives of the Dutch Press to the site of the first aviation exhibition at Amsterdam on May 30th. The party was received by General Snyders, until lately Commander-in-Chief of the Netherlands Forces, Baron Krayenhoff, Flight-Lieut. Plesman, and other officials of the committee.

The exhibition ground lies by the waterside, and is well adapted for the proposed exhibition. Preparations are being made for the accommodation of a large number of exhibits of aeroplanes, seaplanes, and parts, together with everything appertaining to aviation. German and Austrian exhibits, it is stated, will not be accepted.

While the party was being conveyed by boat to the exhibition ground, Lieut. Nieuwenhuis, who had just returned from a remarkably quick flight to and from England, circled overhead, afterwards descending and joining the party.

General Snyders, addressing the company, said it had been felt that Holland must not allow foreign countries to get a start which it could not overtake in this most important branch of human invention and progress.

The exhibition will be held during August.

The Spanish-British Flight.

The Handley Page aeroplane which recently flew from England to Madrid, piloted by Major Darley, R.A.F., left Madrid at 9.30 a.m. on May 29th for England. Unfortunately the machine while attempting to land on the coast near the mouth of the Ardour (north of Biarritz) fell into the sea about 100 yards from the shore. The crew were saved. The aeroplane was carrying some flowers from the King of Spain to Queen Mary, and also an autographed letter from the King and Queen of Spain to King George and Queen Mary.

The Dignity of the Law.

The American Press, which adds so much to the joy of life, has produced the following. One feels that the dignity of the new force is vastly enhanced by these exploits of "Eddie," the "skyrocket" of the "cloud cops," who "praticipated."

The many good points of the article will be noted, but one would have liked more information about the parachute used to demonstrate mail-bag smashing:—

New York's aerial Police Force, co-operating with the shore authorities, made the first airplane "arrest" ever recorded as one of the features of "Aerial Police Day" staged here on the program of the second Pan-American Aeronautical Convention. The "arrest" was but one of the many demonstrations of the practicability of cloud cops as a recognised department of the police force of modern cities.

Fifteen members of the New York air force who made their first public appearance in their sky blue uniforms, put the program through before representatives of leading cities of the east, making a big hit with their work and incidently giving the Atlantic City Air Port the honour of being the first "headquarters" in action in making an actual arrest.

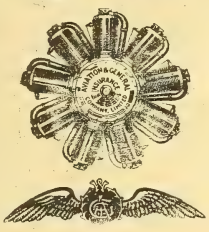
Sheriff Alfred Perkins, of Atlantic County, drove to the aviation field in his automobile and left it parked near the end of the grandstand. While he was chatting with Eddie Stinson, the skyrocket among the aviators here praticipating in the meet, Richard Black, deputy of the Atlantic City Vice Squad, "stole" his automobile and started on a mad dash along the Meadow Boulevard which parallels the airport. The "thief" headed towards Pleasantville, the mainland town at the other end of the meadows five miles away.

Seizing a small Ors parachute, which had been used during the past several days to demonstrate mail bag "smashing" without the necessity of a stop, Sheriff Perkins leaped aboard the Stinson aroplane. About this time Deputy Chief S. Herbert Mapes, of the cloud force "recognised" Black as a "notorious New York Motor bandit" as the "thief" shot past the grandstand. Captain Horace Keane, of the air division, was circling overhead in Aviator Stehlin's 'plane, and Major Mapes, operating a wireless telephone from "headquarters," shot instructions to him that the man in the automobile was "badly wanted in New York." Capt. Keane wheeled about and set sail for the mainland just as Sheriff Perkins, aboard Stinson's machine left the ground, and they took up the pursuit together.

The speeding aeroplanes beat the motor car to Pleasantville where the Sheriff dropped a message via the parachute to a traffic officer on the Shore Road over which all motor traffic must pass to get anywhere on the mainland. The policeman intercepted the speeding "thief" as he approached the crossing and placed him under arrest.

Capt. Keane descended in a field nearby and lodged a detainer with Sheriff Perkins, who had also alighted, and the two walked over to the "prisoner." County Detective Harry Fulmer "happened along" about that time and the "thief" was turned over to him to bring back to the field. Black, handcuffed to Fulmer, was back in front of the grandstand eleven minutes after he had "stolen" the car and the first official aerial arrest was recorded at airport "headquarters."

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PARIS NOTES

June 2nd.

Roget's 2,200 kms. Non-Stop Flight.

Without detracting anything from the measure of success achieved by Hawker and Grieve in their courageous attempt to fly the Atlantic in one stage, one feels that insufficient attention has been paid to the fine performance put up by Lieut. Roget and Capt. Coli in flying from Paris to Rabat without a stop. This was accomplished on May 24th. The two aviators left Villacoublay at 5.10 a.m., and landed at Kenrifa, about 30 kms. from Rabat, at 4.45 p.m. They were to continue their flight to Dakar, change the motor and then attempt to fly to South America, but in landing the machine was reduced to so much *bois cassée*, so this plan had to be abandoned.

The journey was one of 2,200 kms., thus beating both Read and Hawker's flights for distance covered without landing, whilst the speed averaged 185 kms. per hour, as against 135 k.p.h. by Read. Incidentally they win the prize offered by the paper "Maroc-Sport," although it is worthy of note that Roget had planned this flight quite six weeks before this journal mentioned that they would offer a prize to the first aviator flying from France to Morocco in one day. Unfortunately Capt. Coli, the navigator, is suffering from slight contusions as a result of the accident, although, as is so often the case, the pilot escaped unharmed.

The machine, a Breguet 300 h.p. Renault, was equipped with three petrol tanks, 600 litres in the nacelle and 640 litres in two tanks placed between the wings, this being sufficient for a flight of 15 hours. For all practical purposes the route followed was "as the crow flies," that is to say the aviators passed over Bordeaux, Pyrénées, Madrid, Toledo, Cordova, Gibraltar, and Tangiers.

There are rumours here that Lieut. Roget intends to compete for the "Daily Mail" £10,000, if it has not already been won by the time his new machine is ready; this, I hear, is to be a three-engined machine, but will probably not be ready before the autumn.

A New Height Record.

We have long been accustomed to the fact that as each record is made it becomes increasingly difficult to beat it. Nevertheless, they continue to be made, and we do not yet seem to have reached a maximum as in other forms of sport, such as running, cycling, or horse-racing. In proof of this take the record set up on May 28th at Issy-les-Moulineaux by Lieut. Cazale on a 300 h.p. Hispano-engined Nieuport. This aviator left Issy at 8.55 a.m., and in 41 minutes reached a height of 9,300 metres (30,225 ft.). He landed again at 9.10, making the descent in 29 minutes. The machine is a type No. 29, fitted with a "Lumière" airscrew. Its principal features are:—Length, 6 m. 50; span, 9 m. 70; supporting surface, 27 sq. m.; weight, fully loaded, 950 k.

Lieut. Cazale is a war ace, belonging at one time to N 38 Squadron, with which he brought down 12 Huns.

The performance was witnessed by Lieut. Robin, military commissaire, and by two members of the technical section of the Service d'Aviation.

It is probable that by the time these lines appear in print that Foncк will be the holder of the height record; at any rate he intends to try on a similar machine and from the same aerodrome.

Aerial Cargo Lines.

Many weeks ago I was able to record the first advertisement of the first aerial passenger service. This week I am similarly enabled to record the first publicity of an aerial transport company who have been carrying goods and small packages for some weeks past. The following is a facsimile of an advertisement that appears daily in all the leading papers, and is also to be seen placarded about the town. I understand that the Farman firm are shortly coming out with an extensive publicity campaign, with the object of increasing their number of clients, especially regular ones.

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The Ministry of Public Works has in preparation a project for making a monopoly of aerial transport. One supposes it was too much to hope that this new commercial development of considerable industrial importance should have been allowed to continue as private enterprise pure and simple.

A change that may be of far-reaching effect in the industry in this country is the resignation of M. Robert Esnault-Pelterie from the presidency of the Chambre Syndicale des Constructeurs. M. Louis Bréguet is mentioned as a probable successor.

Probable French Air Ministry.

Mr. Daniel Vincent, of whom mention was made a few weeks back, is determined that France shall have an Air Ministry and its own Under-Secretary of State for Air. In this way he hopes to subordinate the military aviation to the commercial, which is all as it should be, so long as the Boches sign the Peace Treaty and stick to its terms.

Under the Presidentship of M. Lecornu, the "Union pour la Securité en Aeroplane" met last week to decide the details of a new competition designed to make aerial travel at least as safe as that over the sea.

A Mosquito Monoplane.

M. Bossoutrot, the aviator, has been experimenting with a small monoplane called the "Mosquito." This machine which is claimed to be the smallest in the world has a span of four metres (13 ft.). The engine is of 20 h.p. On May 31st it flew for one hour at 1,500 metres (about 5,000 ft.).

Another Book.

Some years ago, during the great war, the world was startled by the news that Lieut. (now Captain) Marchal had flown over Berlin, dropping leaflets on the way, and eventually descended at Cholm, in Poland, 80 miles from the Russian frontier. He has now written a book entitled "After My Flight Over Berlin," in which he describes his journey, capture, treatment, and escape. At the moment he, in company with other famous aces, is stationed at Saint Raphael, from which place he contemplates a flight to Algiers and back in one day.

All the postal services by aeroplanes are working regularly, notwithstanding that accidents happen from time to time. Even the twice a day Nimes-Nice service, which was suspended for a few days owing to the insufficient number of machines, has restarted.

A committee has been formed at Vincennes to affix a marble tablet to the house in which Védrines last lived, commemorating his various echievements.

And Another Aviette.

The prospect of evolving a successful aviette continues to excite considerable interest, not only among the freaks, but also amongst those whose opinions are considered worthy of attention if only on account of their actual "faits accomplis." Thus we find that Captain Didier, of the R.G.A.E., has patented an aviette which weighs less than 30 kilograms. It is a small monoplane of 5 metres span, 2 m. 60 length, fitted with two 3 h.p. motors, each revolving in opposite directions, and, in turn, each actuating a pusher airscrew. The machine is to be known as the "Oiseau Bleu." One hopes soon to record that the oiseau flew!—F. T. N.

SWISS NEWS.

Now that the war is over some of the neutral countries are producing their latest military machines! Thus, from Geneva comes news of a new machine made by the Schweizerische Wagons Fabrik of Schlieren, for the Federal Army. It is a biplane fitted with two machine-guns, one synchronised, firing through the airscrew. The machine has a pronounced dihedral, and the top wings are swept back. They have a span of 11.5 metres, a chord of 1.7 metres, and a fuselage length of 6.80 metres. All the control wires pass inside the fuselage. Ailerons are fixed to the upper planes.

The engine is a type A.S. III. Argus, of 118-180 h.p. constructed by the SeeBacher Maschinenbau A.G. The airscrew has a diameter of 2.75 metres. The landing chassis is fitted with compressed air shock absorbers.

Weight, light, is 740 kgs.; useful load 400 kgs., plus 25 kgs. of water, which gives a total load of 1,165 kgs., or 38 kgs. per square metre of surface, or 6.3 kgs. per h.p.

The first trials were quite successful. She took off in 50 metres, rose to 2,000 metres in 8 minutes, and to 4,000 in 21.

ITALIAN NOTES.

Serjt. D'Urio arrived at Rome one day last week, having flown from Salonika in 6½ hours. His machine was loaded up with the usual O.H.M.S. post, a thousand military franchise letters, and a document for the Postmaster-General.

A company has been formed for transporting by air fresh fish (which is very abundant and delicate there) from Sardinia to the Capital. Owing to lack of swift transport the islanders only catch enough fish for the immediate needs of their island at present.

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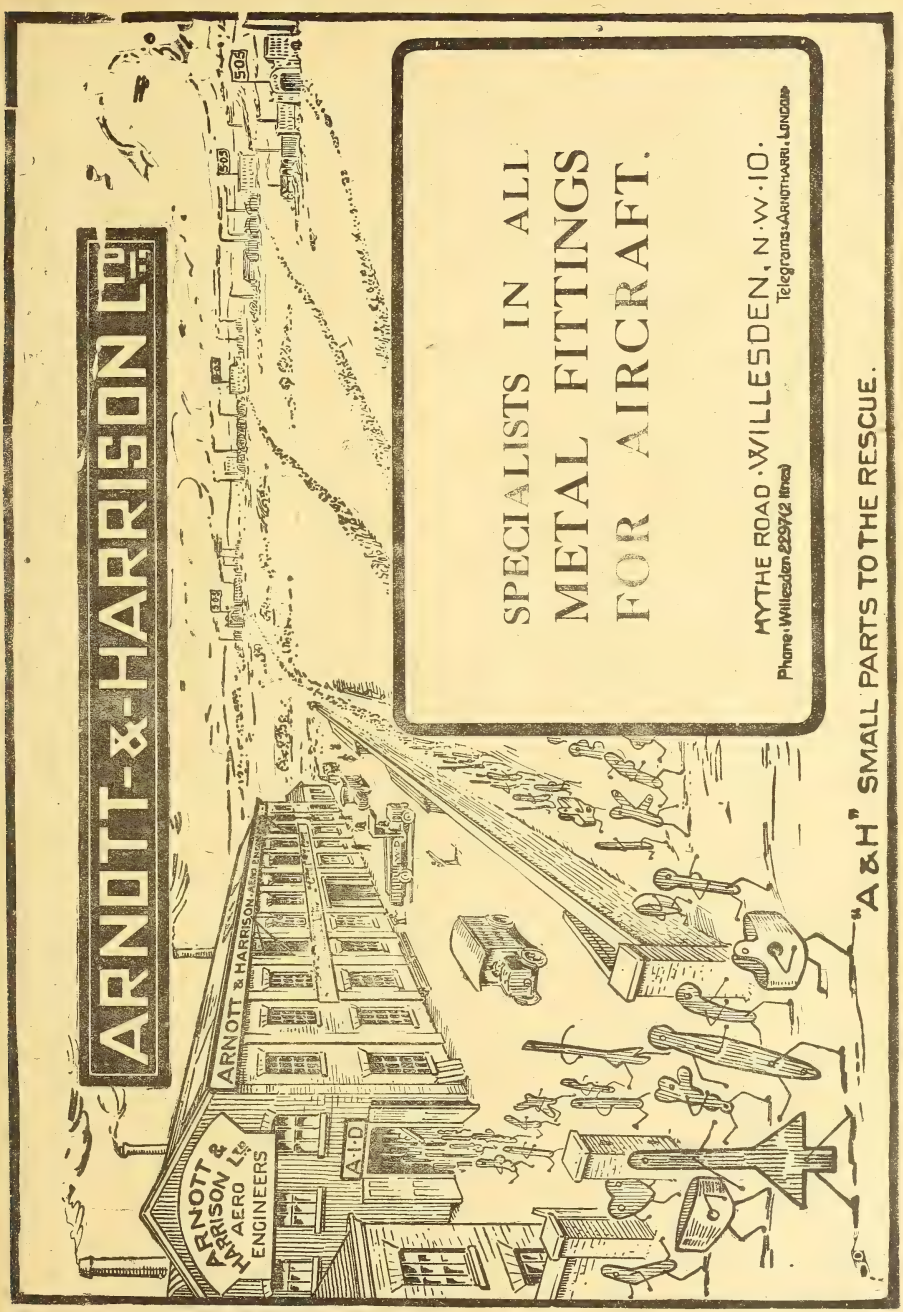
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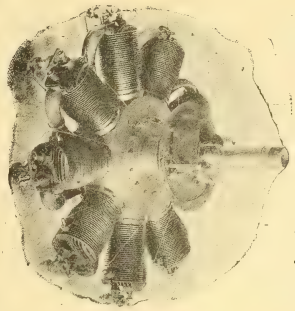
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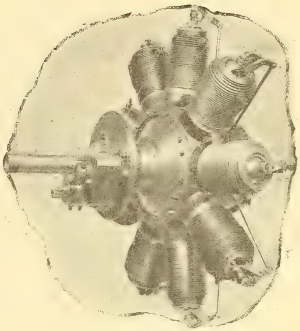
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THE WEEKLY COMMENTARY.

The final instalment of Capt. Sayers' articles on "Commercial Aircraft Design" continues the argument in favour of machines designed for low cruising speeds. The importance of the development of wing forms which will combine a high lift/drag ratio with a high value of the lift coefficient is insisted upon.

Capt. Sayers' suggestions as to the actual reduction in operating costs which can be obtained by a relatively small reduction in speed are rather startling.

Mr. C. W. Tinson's article on "Longitudinal Stability" is completed in this issue. An actual example of this method is worked out in some detail, and a number of instructive points are brought out.

A number of aeroplanes of various types designed and built by the famous firm of Wm. Beardmore & Co., Ltd., Dalmuir, near Glasgow, are described in the articles on "Modern British Aircraft."

Particularly interesting are the W.B. III and IV ships' scouts.

Only those designers who have actually attempted the design of this class of machine can properly appreciate the difficulties imposed by the requirements of small stowage space on shipboard, and the necessity for some form of emergency alighting and flotation gear for use when a descent on the sea is necessary.

A note will be found in this issue dealing with the possible causes of the accident to the Tarrant triplane.

COMMERCIAL AIRCRAFT DESIGN.—XIV.

SPEED, ITS VALUE AND ITS COST.—(*Concluded.*)

By Capt. W. H. Sayers, late R.A.F.

So far the question has been dealt with on the basis of known wing sections.

A belief has already been expressed that there are very great possibilities of further development in the qualities of the high life type of wing. The author, on the basis of previous experiments, believes that he can at once produce a wing having an L/D ratio of 15 or more at a lift coefficient of 0.7. He has seen test results of wings developed by others who have enjoyed less restricted opportunities for experiment which actually show an L/D of over 20 at this same lift coefficient, with a maximum value of L = 1. If it is assumed that a wing with L/D = 17 at L = 0.7 and a maximum value of L = 1 can be used, then the table of loading per sq. ft., wing h.p. per ton, and landing speed for various economical cruising speeds becomes :—

Cruising Speed.	Loading.	Wing H.P. per ton.	Landing Speed.
20 m.p.h.	1.7 lbs. sq. ft.	7.8	18 m.p.h.
40 ,,	7.0 ,,	15.6	37 ,,
60 ,,	15.0 ,,	23.4	54 ,,
80 ,,	27.5 ,,	31.2	73 ,,

All these landing speeds are high compared to the cruising speed, but it is undoubtedly possible to reduce the landing speed, if by no other means, by some method analogous to the "Fairey" trailing edge flap.

A wing section giving such results brings the 40 m.p.h. machine to within reasonable limits of loading, and hence to a satisfactory structure weight.

Effect of Increased Loading.

It is, however, more directly instructive to consider the effect on the "standard" machine of redesigning it with this hypothetical wing, for a cruising speed of 60 m.p.h. and a loading of 15 lbs. per sq. ft.

This increases the loaded weight to 3,900 lbs.

To obtain the same factor of safety on the same overall dimensions and general arrangement, the structure weight will have to be increased from 930 to 1,600 lbs. The body resistance need not increase in any greater ratio than as the cube root of the loaded weights, roughly as 1.2 to 1. The wing h.p. necessary is still 23.4 per ton, or 41 for this total weight. The body resistance h.p. at 60 m.p.h. becomes $1.2 \times 9.6 = 11.52$, or a total airscrew h.p. of 53. For the initial climb of 300 ft. per minute and for roughly the same speed margin of 15-18 m.p.h. an additional 35 propeller h.p. is needed—a total of 85 h.p., which at 75 per cent. airscrew efficiency calls for 112 b.h.p.

Taking the same weight per h.p. as on the 1 ton 60 m.p.h. machine, the power plant weight will be 425 lbs.

For a 250-mile journey the fuel needed will become 230 lbs.

Taking pilot at 180 lbs., the total weight without cargo is 1,600 + 425 + 230 + 180 = 2,435 lbs., leaving 1,465 lbs. as paying cargo capacity.

A Great Maximum Range.

It is interesting to note that this machine, carrying 1,700 lbs. of fuel and no cargo, would have a still-air full-speed range of flight of 1,820 miles, and in still air at 60 m.p.h. a range of 2,400 miles, or 40 hours' duration.

Compared with the "standard" machine, the cost of the aeroplane structure would be less than proportional to the structure weight ratio of 1.72 to 1. Probably it would be not more than 1.5 to 1. The engine cost compared to the "standard" would be roughly as the h.p., probably less. This ratio is 112/150 = 0.75.

As the engine cost in the "standard" machine was twice as much as the aeroplane, our last engine will cost 1.5 times as much as the "standard" cost of aeroplane structure alone. Thus the whole of the latter

machine and engine complete costs 3 times as much as the "standard" without engine, or exactly the same as the "standard" complete, or, on the same basis as there taken, £1,200.

Taking again the same machine with the hypothetical high lift wing, and a loading of 7 lbs. per sq. ft., corresponding to cruising speed = 40 m.p.h., one arrives at the following figures.

Total full weight = 1,820 lbs.

Engine h.p. for 40 m.p.h. + climb and speed surplus, 40 b.h.p.

Power plant weight, 180 lbs.

Fuel for 250 miles, 125 lbs.

Structure weight, 780 lbs.

Pilot, 180 lbs.

Total, less cargo, 1,225 lbs.

Cargo capacity, 595 lbs.

Prime cost of aeroplane, roughly equal to "standard," £400.

Engine cost, 40/150 of "standard," £215.

Total machine, £615.

It will be seen that for this size machine 40 m.p.h. is too low a cruising speed, because the structure weight is relatively large.

Collecting all the results into tabular form, one has the figures at the foot of this page.

A Summing Up.

As all these machines are of identical leading dimensions, the cost of shed accommodation is the same. Capital charges and depreciation, maintenance and repairs will be closely proportional to their prime costs.

The relative cost of pilots' wages, taking into account both the time taken over a given journey and the total ton-mileage, is given in the last column, where the cost has been taken as unity for the "standard" machine.

The results which can be obtained with low cruising speeds will improve with increasing dimensions, with shorter distance journeys, and with lowered factors of safety. All these machines are based upon the retention of the original factor of safety of the "standard" machine, which had a minimum factor of 6 for the rear spar and elsewhere and one of 8 for the front spar.

But the figures suffice to show the immense reduction in cost of operation which will become possible if machines are designed to operate at low cruising speeds, more particularly if it is possible to develop wings which will permit good L/D values to be obtained at low speeds in conjunction with very high loadings.

A Case in Point.

In a brochure issued by Messrs. Vickers and reproduced in the Technical Press, the cost of passenger transport from England to the United States by airship is contrasted with that when an aeroplane is employed.

The estimated passenger rate by airship is there given, for London-New York, as £48.

By aeroplane the figure rises to £115.

These figures are based on a schedule speed for the airship of 60 m.p.h., and a maximum of 75 m.p.h., and for the aeroplane of an average speed of 85 m.p.h., whilst in actual flight, with stops totalling 8 hours *en route*.

If their proposed machines were remodelled for a maximum speed = 75 m.p.h. and an economical cruising speed of 60 m.p.h., it would be possible to reduce the total engine h.p. to roughly 75 per cent. of that suggested, which, even carrying the same total weight of fuel, would add at least 50 per cent. to the available capacity for crew and passengers. Leaving the crew at Messrs. Vickers' estimate, the paying load increases from 4,670 lbs. to 7,670 lbs.

The original weight of fuel would permit the maximum distance flown to be increased at least 25 per cent., or from 1,800 to 2,225 miles. This is considerably more than London-Newfoundland non-stop. If the fuel is reduced to that necessary for this stage, a further 1,000 lbs. of paying cargo can be carried. Which is to say that, making no allowances for the reduced cost of lower-powered engines, the estimates of cost per passenger by aeroplane would be reduced in the ratio $\frac{467}{867}$, or roughly halved, by simply taking the same cruising speed for the aeroplane as for the airship.

The fare per passenger then is reduced from £115 to £58, as against £48 for the airship.

The time taken for the whole journey, as against Vickers Ltd.'s figures for the aeroplane, will be increased from 46 hours to 59, which is practically exactly that allowed for the airship.

A General Law.

Generally for all forms of transport it has been found that the total cost of operation increases as the cube of the speed. Aeroplanes are not exempt from some very similar penalty for increased speed.

Under the very appropriate heading of "Fictitious Figures for Flying" or the like, various estimates of the cost of Aerial Transport over 500-mile stages at 100 m.p.h. have appeared in recent issues of The Aeroplane.

These estimates have varied from £1 to £6 per ton-mile, or roughly from 1s. 3d. to 7s. 6d. per passenger-mile. Assuming the V^3 law to hold, as it almost certainly does, at 60 m.p.h. these figures become 3¼d. to 1s. 5½d. per passenger-mile.

Prospects for the Immediate Future.

Thus the prospect of the aeroplane directly competing with present modes of transport is not hopeless.

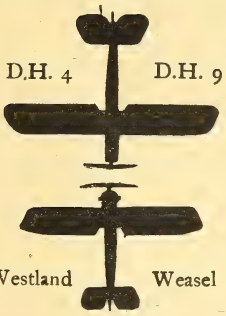
The prospects, on the contrary, are excellent, upon the sole condition that the designers of commercial aircraft will forget all about the wonderful speed achievements of the war type of aeroplane, and will settle down to design reasonable traffic-carrying appliances.

After all, the successful designer of commercial motor vehicles does not work with the idea of breaking speed records constantly before him. Why should the commercial aircraft designer?

Finis.

Table Showing Effects of Designing for Various Economical Cruising Speeds and Loadings.

Machine.	Cruising Speed.	Loading lbs./sq. ft.	Cargo Capacity.	Fuel for 250 Miles.	Ton Mile Capacity.	Fuel Wt. per Ton Mile.	Prime Cost per Ton Mile of Capacity.	Relative Cost of Pilots Wages per Ton Mile.
"Standard" ..	75 m.p.h.	8 64	400 lbs.	280 lbs.	4.25	66 lbs.	£280	1.00
No. 1. ..	60 m.p.h.	8.64	705 lbs.	150 lbs.	7.8	19 2 lbs.	£102	0.68
No. 2. ..	60 m.p.h.	15.0	1465 lbs.	230 lbs.	16.3	14 1 lbs.	£74	0.34
No. 3. ..	40 m p h.	7.0	595 lbs.	125 lbs.	6.6	18.4 lbs.	£94	1 20



These Illustrations give an idea of the range of our War production, which included machines of Westland design.

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Short Seaplane
200 HP. Canton



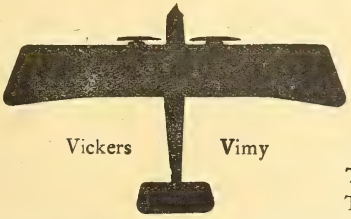
Short Seaplane
225 HP. Sunbeam



Sopwith 1½' Strutter



D.H. 9A



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V.—Sir Wm. Beardmore & Co., Ltd.

Before the outbreak of war the famous shipbuilding and engineering firm of Beardmore had arranged to acquire the British rights in the German D.F.W. designs.

After the outbreak of hostilities the firm built large numbers of machines to official specifications, and in addition carried on work on designs of their own.

The technical work of the Aircraft Department at Dalmuir has been throughout under the control of Mr. G. Tighman Richards (late Lieut. R.N.V.R.).

The following descriptions and illustrations give an idea of their original design work during the war:—

THE BEARDMORE BIPLANE W.B. 1.

This machine was an early bomber design on sound and normal lines.

SPECIFICATION.

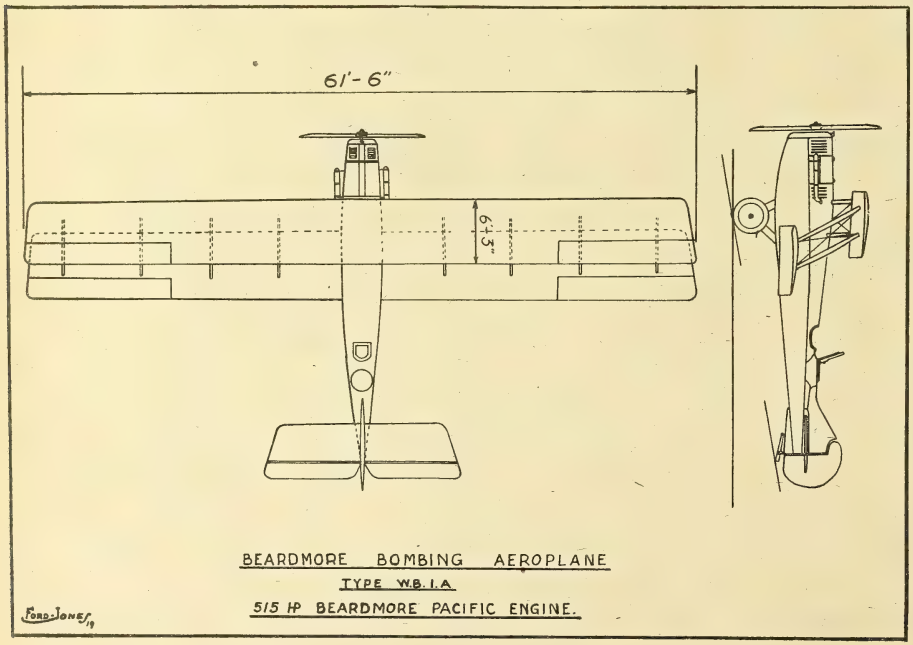
Type of machine	Biplane.
Name or type No. of machine	W.B. 1.
Purpose for which intended	Bomber.
Span	61 ft. 6 ins.
Gap	7 ft.
Overall length	32 ft. 10 ins.
Maximum height	14 ft. 9 ins.
Chord	7 ft.
Total surface of wings, including ailerons	796 sq. ft.
Span of tail	18 ft.
Total area of tail	106 sq. ft.
Area of elevators	40 sq. ft.
Area of rudder	20 sq. ft.
Area of fin	14.2 sq. ft.
Area of ailerons	28.32 sq. ft. each, 113.28 sq. ft. total
Maximum cross section of body	15.2 sq. ft.
Horizontal area of body	88 sq. ft.
Vertical area of body	81.6 sq. ft.
Engine type and h.p.	240 h.p. Sunbeam or 230 h.p. Beardmore "Adriatic."
Airscrew, diam. and revs.	10 ft. 6 ins. dia., 1,075 r.p.m (with Sunbeam).
Weight of machine empty	3,410 lbs. (with Beardmore).
Load per sq. ft.	7 lbs.
Weight per h.p.	23 lbs.
Tank capacity in hours	7.3 hours.
Tank capacity in gallons	137 gallons.
Performance—	
Speed low down	91 m.p.h.
Landing speed	48 m.p.h.
Climb—	
To 5,000 feet	26 mins.
To 10,000 feet	44 mins.
Disposable load apart from fuel	1,100 lbs.
Total weight of machine loaded	5,600 lbs.

THE BEARDMORE BIPLANE W.B. 1A.

An enlarged and more powerful edition of the W.B.1. The general characteristics are obvious from the scale drawings reproduced. A noticeable feature is the very far-aft position of pilot and passenger's seat.

SPECIFICATION.

Type of machine	Biplane.
Name or type No. of machine	W.B. 1a.
Purpose for which intended	Bomber.
Span	70 ft.
Gap	7 ft.
Overall length	32 ft. 10 ins.
Maximum height	15 ft. 8 ins.
Chord	7 ft.
Total surface of wings, including ailerons	946 sq. ft.
Span of tail	19 ft.
Total area of tail	110 sq. ft.
Area of elevators	33.5 sq. ft.
Area of rudder	20 sq. ft.
Area of fin	14.2 sq. ft.
Area of ailerons	29.5 sq. ft. each, 118 sq. ft. total.
Maximum cross section of body	22.5 sq. ft.
Horizontal area of body	105 sq. ft.
Vertical area of body	131 sq. ft.
Engine type and h.p.	Beardmore "Atlantic" 500 h.p.
Airscrew, diam. and revs.	14 ft. dia., 900 r.p.m.
Weight of machine empty	4,537 lbs.
Load per sq. ft.	9.4 lbs.
Weight per h.p.	17.3 lbs.



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Tank capacity in hours	6.5 hours.
Tank capacity in gallons	214 gallons.
Performance—	
Speed low down	110 m.p.h.
Speed at 10,000 feet	101 m.p.h.
Landing speed	65 m.p.h.
Climb—	
To 5,000 feet	12 mins.
To 10,000 feet	27 mins.
Disposable load apart from fuel	2,700 lbs.
Total weight of machine loaded	8,900 lbs.

The Beardmore W.B.II and IIA.

These two machines differ mainly in their power plant and performance. Both are small two-seater fighter and reconnaissance machines of high performance, designed upon sound and proved lines.

The pilot is sufficiently high to see both over and under the upper plane, and the heavy stagger gives an excellent view downwards over the leading edge of the lower plane.

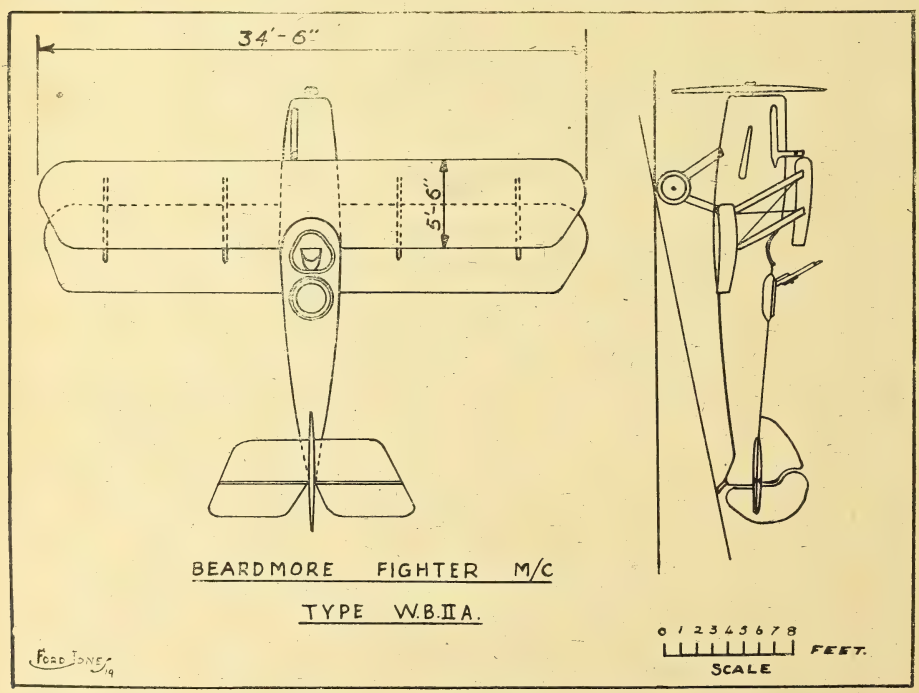
THE BEARDMORE BIPLANE W.B. II.

Type of machine	Biplane.
Name or type No. of machine	W.B. II.
Purpose for which intended	Fighter.
Span	34 ft. 10 ins.
Gap	5 ft. 6 ins.
Overall length	27 ft. 3 ins.
Maximum height	10 ft. 11 ins.
Chord	5 ft. 6 ins.
Total surface of wings including ailerons	354 sq. ft.
Span of tail	13 ft.
Total area of tail	49 sq. ft.
Area of elevators	21 sq. ft.
Area of rudder	11.5 sq. ft.
Area of fin	6 sq. ft.
Area of ailerons	15 sq. ft. each, 64 sq. ft. total.
Maximum cross section of body	11 sq. ft.
Horizontal area of body	65 sq. ft.
Vertical area of body	64 sq. ft.
Engine type and h.p.	Hispano-Suiza 200 h.p.
Airscrew, diam. and revs.	9 ft. dia., 1,186 r.p.m.
Weight of machine empty	1,705 lbs.
Load per sq. ft.	7.5 lbs.
Weight per h.p.	13.25 lbs.

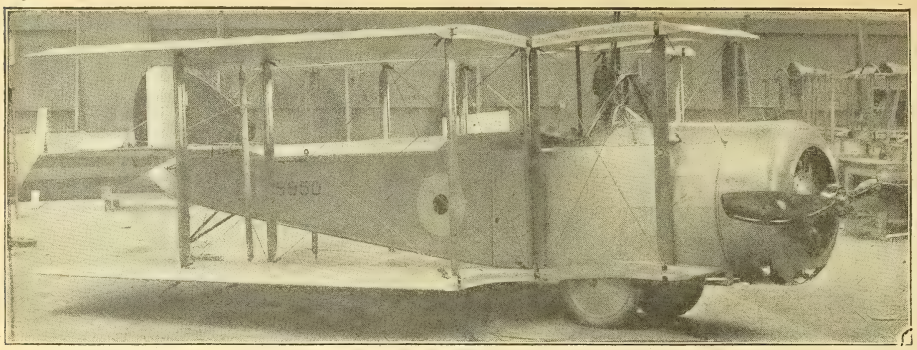
Tank capacity in hours	2.8 hours.
Tank capacity in gallons	41.5 gallons.
Performance—	
Speed low down	120 m.p.h.
Speed at 10,000 feet	111 m.p.h.
Landing speed	50 m.p.h.
Climb—	
To 5,000 feet	7 mins.
To 10,000 feet	15 mins.
Disposable load apart from fuel	540 lbs.
Total weight of machine loaded	2,950 lbs.

THE BEARDMORE BIPLANE W.B. II.A.

Type of machine	Biplane.
Name or type No. of machine	W.B. IIa.
Purpose for which intended	Fighter and Reconnaissance.
Span	34 ft. 10 ins.
Gap	5 ft.
Overall length	27 ft. 7 ins.
Maximum height	10 ft. 1 in.
Chord	5 ft. 6 ins.
Total surface of wings, including ailerons	354 sq. ft.
Span of tail	13 ft.
Total area of tail	49 sq. ft.
Area of elevators	21 sq. ft.
Area of rudder	11.5 sq. ft.
Area of fin	8.1 sq. ft.
Area of ailerons	16 sq. ft. each, 64 sq. ft. total.
Maximum cross section of body	11.7 sq. ft.
Horizontal area of body	66 sq. ft.
Vertical area of body	75 sq. ft.
Engine type and h.p.	Beardmore "Adriatic," 230 h.p.
Airscrew, diam. and revs.	10 ft., 1,350 r.p.m.
Weight of machine empty	1,650 lbs.
Load per sq. ft.	7.6 lbs.
Weight per h.p.	11.7 lbs.
Tank capacity in hours	4.5 hours.
Tank capacity in gallons	75 gallons.
Performance—	
Speed low down	125 m.p.h.
Speed at 10,000 feet	117 m.p.h.
Landing speed	50 m.p.h.
Climb—	
To 5,000 feet	5 mins.
To 10,000 feet	12 mins.




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The Beardmore Ship Scout Type W.B.III (80 h.p. Le Rhône Engine) with wings and chassis folded.

Disposable load apart from fuel	460 lbs.
Total weight of machine loaded	2,700 lbs.

THE BEARDMORE BIPLANE W.B. III.

The Beardmore W.B. III. was evolved from the Sopwith "Pup" in an effort to turn this machine into a ship-plane, the principal modifications being folding planes and a retractable under-carriage, in order to simplify stowage on board ship. The fuselage and tail unit are practically of Sopwith design, the overall length being only slightly increased.

Instead of four short centre-section struts, four long struts, two on either side of the fuselage, are fitted with a short horizontal strut connecting them with the upper larger end of the fuselage. The main planes are unstaggered, and hinged at the main rear spar close up to the fuselage.

Two sets of interplane struts are fitted to each set of main planes, one set being placed at the inner edge of the plane in order to preserve the truss when the wings are folded.

Ailerons are fitted to upper and lower planes and are operated on the Nieuport principle, the upper and lower ailerons being inter-connected by a strut.

An ordinary Vee-type under-carriage is fitted, the front members of the vee being hinged, and the rear members equipped with a release device operated from the pilot's seat which allows the under-carriage to collapse into the fuselage, leaving half the wheels exposed. The armament consists of a Lewis gun fitted on a special mounting in front of the pilot's cockpit to allow it to fire through an opening in the centre section.

Particulars of this machine are given in the following table:—

SPECIFICATION.

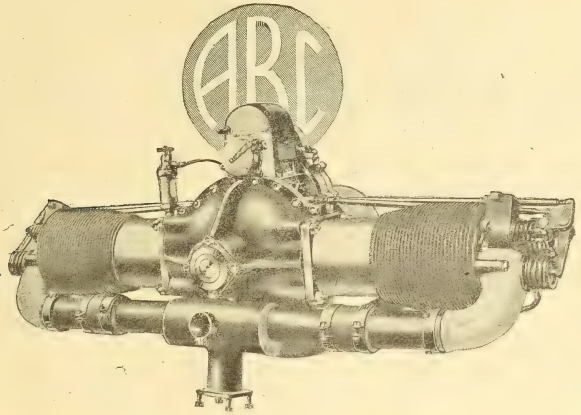
Type of machine	Biplane.
Name or type No. of machine	W.B. III.
Purpose for which intended	Ship's Scout.
Span	25 ft.
Gap	4 ft. 9 ins.
Overall length	20 ft. 2.5 ins.
Maximum height	8 ft. 1.25 ins.
Chord	5 ft. 1.5 ins.
Total surface of wings, including ailerons	243 sq. ft.
Span of tail	10 ft. 1 in.
Total area of tail	34.5 sq. ft.
Area of elevators	11.5 sq. ft.
Area of rudder	4.5 sq. ft.
Area of fin	3.5 sq. ft.
Area of ailerons	5.75 sq. ft. each, 23 sq. ft total.
Maximum cross section of body	4.6 sq. ft.
Horizontal area of body	17 sq. ft.
Vertical area of body	39 sq. ft.
Engine type and h.p.	Clerget or Le Rhône 80 h.p.
Airscrew, diam. and revs.	8 ft. 6 ins.; 1,200 r.p.m.
Weight of machine empty	880 lbs.
Load per sq. ft.	5.3 lbs.
Weight per h.p.	16.1 lbs.
Tank capacity in hours	2.75 hours.
Tank capacity in gallons	18 gallons.
Performance—	
Speed low down	103 m.p.h.
Speed at 10,000 feet	88 m.p.h.
Landing speed	40 m.p.h.
Climb—	
To 5,000 feet	9 mins.
To 10,000 feet	24 mins.
Disposable load apart from fuel	300 lbs.
Total weight of machine loaded	1,290 lbs.

THE BEARDMORE BIPLANE W.B. IV.

The Beardmore W.B.IV is a single-seater ship's scout designed with flotation gear in the fuselage and a dropping undercarriage. In order to keep the size of the flotation gear, which is actually built into the fuselage, down to a minimum, the power unit is



The Beardmore W.B.IV Ship Scout (290 h.p. Hispano-Suiza Engine).



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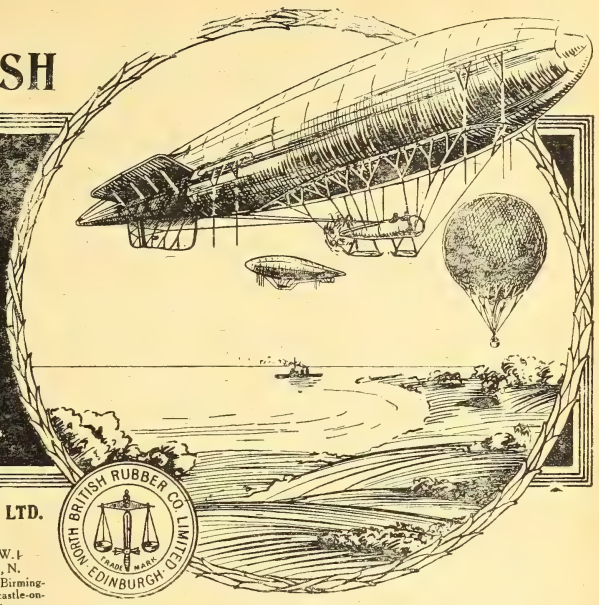
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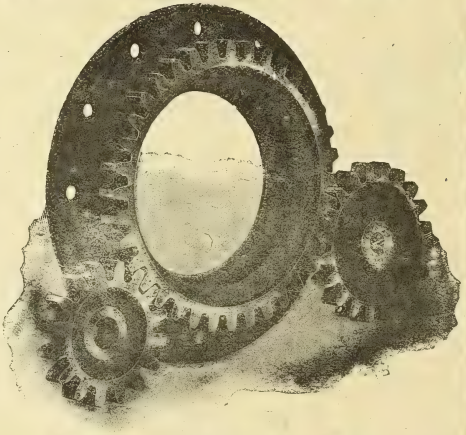
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Aeroplane Manufacturers—

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Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

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British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3006.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hampstead 5551.

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Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd (Salmson), 87, Victoria Street, London, S.W.1. "Aerofight, Vic, London." Vic 5026.

Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1910.

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Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1. "Rolhead, London." Gerrard 1634-5-6.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton."

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames." Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1984.

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Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

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Gears—
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Chas. P. Kinnell and Co., Ltd., 65 & 68a, Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 765.

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British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

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Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

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Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 5944.
Bray, Gibb & Co., Ltd., 166, Piccadilly, W.1.
S. Sackville & Sons, Duchy Chambers, 4, Clarence Street, Manchester.
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Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 999 (2 lines).

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The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.
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Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

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Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.
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Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.
Integral Propeller Co., Ltd., "Aviprop, Hyde, London." Hendon 9. Kingsbury 104.
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Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
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The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

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Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

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British Aerial Transport Co., Ltd. Head Office: 15, Conduit Street, London, W.1. "Britagram, Reg, London." Mayfair 057, 638.

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British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 2086.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudrophan, Crickle, London." Hampstead 5551.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 2103 and 4424.

Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2004 (2 lines).

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176.

Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Graham-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.
London Office, 12, Regent Street, S.W.1. Regent 2084.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydroplane, Crickle, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James's St., Piccadilly, London, S.W. "Sociable, St. James, London." Regent 012.

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 382 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge." Woking 331; Byfleet 171.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuport, Crickle, London." Willesden 2455.

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

The Regent Carriage Co., Ltd., 226/232, New King's Road, Fulham, S.W.6. "Carbodie, London." Putney 2226-2231.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 2556-8551, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 105.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tusted, Phone, London." Regent 378.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 468 (8 lines).

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin." Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet." Byfleet 1, 2 & 3.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerstya, Knights, London." Kensington 6740.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 6666.

Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Airships—

Airships, Ltd., High Street, Merton. Wimbledon 1374.

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3580 Central. (5 lines.)

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

C. G. Spencer and Sons, Ltd. (See under "Balloons.")

Aluminium Castings (Sand and Die)

Coan, R. W., 210, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 3846.

Balloons—

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3580 Central. (5 lines.)

C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronaut, London." Dalston 1695.

Bent Timber Parts—

Hopton & Sons, George Street, Euston Square, London, N.W.1. Hoptons, Euspare, London." Museum 496.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 15.

Bearings (Etonia Cast Phosphor Bronze)

Brown Bros., Ltd., 61, Eastern St., E.C.1. Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 9027.

Blowpipes (Oxy-Acetylene)—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4850.

Imperial Light, Ltd., 121, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Vic. 3540 (3 lines).

Bolts—

Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16. Dalston 2500 (2 lines).

Books (Aero Engines)—

Dykes' Auto Encyclopedia, Gillum, 149, Strand, W.C.2.

Buildings—

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Rubery, Owen & Co., Darlaston, South Staffs.

Cable Coverings and Cable Controls—

The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green." Acock's Green 105 & 104.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2466 (3 lines).

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4670.

Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricodon, Fen, London." Avenue 34 and 35.

Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2265.

Dunhill's, Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3580 Central. (5 lines.)

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., 61, Eastern St., E.C.1. Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 1403 & 4404.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond. "Acros, Richmond." Richmond 1683.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thomson Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafre's, Piccy, London." Gerrard 5312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 3091.

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 256.

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 430.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 055.

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd. (Salmson), 57, Victoria Street, London, S.W.1. "Aerofight, Vic, London." Vic 5026.

Gordon Watney & Co., Ltd., Weybridge. "Mercedes, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1304.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1010.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifuel, London." Gerrard 8426.

Rolls-Royce, Ltd., 11 and 15, Conduit Street, W.1. "Rolloid, London." Gerrard 1634-36. The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 985.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames." Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1084.

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1864.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2466 (3 lines).

Mann, Egerton & Co., Ltd., 157, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Electric Cables—

E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 248.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1864.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1864.

Mann, Egerton & Co., Ltd., 157, Cleveland Street, London, W. "Installing, Eusroad." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

Flare Lights—

Imperial Light, Ltd., 121, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.



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Fluxes—

Imperial Light, Ltd., 121, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—

Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Galvanising—

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—

J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.

Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

Glue—

Cannon, H., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Bececolin, Cannon, London." City 1206.

Improved Liquid Glues Co., Ltd., 61, Hermitage Street, E. (Croad.) "Exceriden, Phone, London." Avenue 4042-3.

Mouline Co., 8, Arthur Street, E.C. Bank 5873.

Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1349.

Heating and Ventilating—

Chas. P. Kimball and Co., Ltd., 65 & 653, Southwark Street, London, S.E.1. "Kimball, London." Hop 572 (2 lines).

The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 760.

Instruments—

British Wright Co., Ltd., 53, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 390.

Insurance—

Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 0414.

Bray, Gibb & Co., Ltd., 160, Piccadilly, W.1.

S. Sackville & Sons, Duchy Chambers, 3, Clarence Street, Manchester.

Harold Heward, Ltd., 13-14, Abchurch Lane, King William Street, E.C.4. "Carinsur, London." Central 156 (2 lines).

Percy Wingfield, 22, Newgate Street, E.C.1. City 4972.

Leather Cloth—

New Pegamoid, Ltd., 114, Queen Victoria Street, London. "Pegamoid, Cent, London." City 9703 (2 lines).

Lubricating Oil Refiners and Merchants—

W. H. Dick & Co., Ltd., 90, Fenchurch Street, E.C., Telegrams, Dicotto Fen, London. Avenue 7851 (2 lines).

Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—

The British Lighting & Ignition Co., Ltd., 264, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 430.

The British Thomson Houston Co., Ltd., Lower Ford Street, Coventry. "Associdal, Coventry." Coventry 278.

Metal Casement Manufacturers—

Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 099 (2 lines).

Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 4245. Avenue 1432.

Metals in General—

Samuel Mercer & Co., 168, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6542.

Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.

Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. "Bolts and Nuts." "Baylies, Wolverhampton." Wolverhampton 1041.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Mann, Egerton & Co., Ltd., 157, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

Rubery, Owen & Co., Darlaston, South Staffs.

Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 76.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvopul, Phone, London." Holborn 320.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—

Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 413.

Rubery, Owen & Co., Darlaston, South Staffs.

Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 1953-4034-1055.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.

Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham." Central 793.

MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow. Tapes, Cords, and Threads. City 3115.

Motor Cars—

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegear, Eusroad, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1349.

Oils—

C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London." Central 11305 & 13466.

Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savepanivo, Ave, London." London Wall 3256-3257.

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3580 Central. (5 lines.)

C. G. Spencer & Sons, Ltd. (See under "Balloons.")

Piston Rings—

The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149.

Presswork—

Rubery, Owen & Co., Darlaston, South Staffs.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 952.

Integral Propeller Co., Ltd., "Avmpop, Hyde, London." Hendon 9. Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Acrosticks, Weybridge." Weybridge 450-451.

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 382 (4 lines).

Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 2054-5.

Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—

The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 29.

Rawhide Hammers—

Ira Stephens, Whitchurch Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—

Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 5811 & 5812.

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3580 Central. (5 lines.)

Safety Belts—

C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4152.

Screwing Die Heads—

Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Invadors, Redditch." Redditch 71.

Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 382 (4 lines).

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).

Short Bros., Rochester. "Seaplanes, Rochester." Chatham 047.

Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights

Brown Bros., Ltd., Great Eastern St., E.C.1.

Imperial Light, Ltd., 121, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Rubery, Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—

The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4850.

British Metal (Kingston), Ltd., Kingston-on-Thames. (Staffs.)

Rubery, Owen & Co., Darlaston, South Staffs.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.

Imperial Light, Ltd., 121, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

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Solder Manufacturers—

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Sparking Plugs—

Brown Bros., Ltd., Great Eastern St., E.C.1
Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 2758.
The Robinhood Engineering Works, Ltd., 4, Newlands, Putney Vale, S.W.15. Makers of KLG Plugs. "Kaelgee, Phone, London." Putney 2132-3.

Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

Steel—

Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield" Central 4522-3-4.

Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Tapes and Smallwares—

MacLennan, John, & Co., 30 Newgate Street, E.C.1. And at Glasgow. City 3115.
C. E. Matthews & Co., Ltd., Castle Works, Bermondsey Square, S.E.1. "Webbance, Berm, London." Hop 4058.

Timber—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London. Museum 496. Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Time Recorders—

Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—

Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349.

Turnbuckles—

Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery, Owen & Co., Darlaston, South Staffs.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston road." Museum 70 (4 lines).

Tyres and Wheels—

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Central 3880 (5 lines).
The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Varnishes—

The British Emaillite Co., Ltd., 50, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 2800.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjap, Phone, London." Mayfair 6347 (3 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61

Welding and Cutting Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Welding Repairs—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac," Phone, London." Victoria 3540 (3 lines).

Wind Shields—

Auster, Ltd., 133, Long Acre, W.C. "Winflector, London." Regent 5910.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Wire Gauze—

Greening, N., & Sons, Ltd., 16, Finsbury Street, London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.

Wire and Cables—

Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

Wirework—

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Woodworking Machinery—

Robinson, Thomas, & Son, Ltd., Rochdale, "Robinson, Rochdale." Rochdale 467.
Sagar, J., & Co., Ltd., Halifax. "Sawtooth," Halifax." Halifax 136.
Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.

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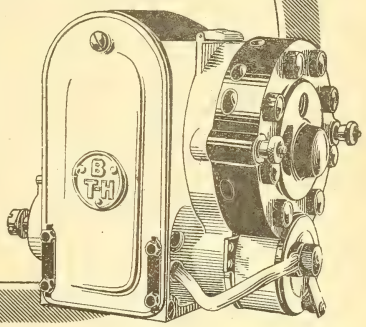
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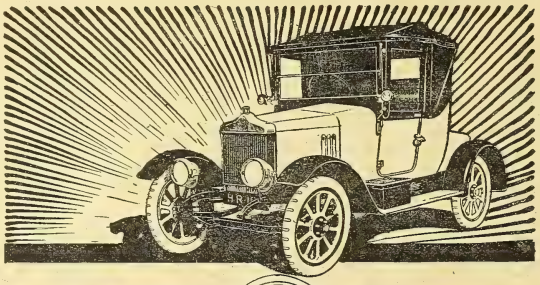
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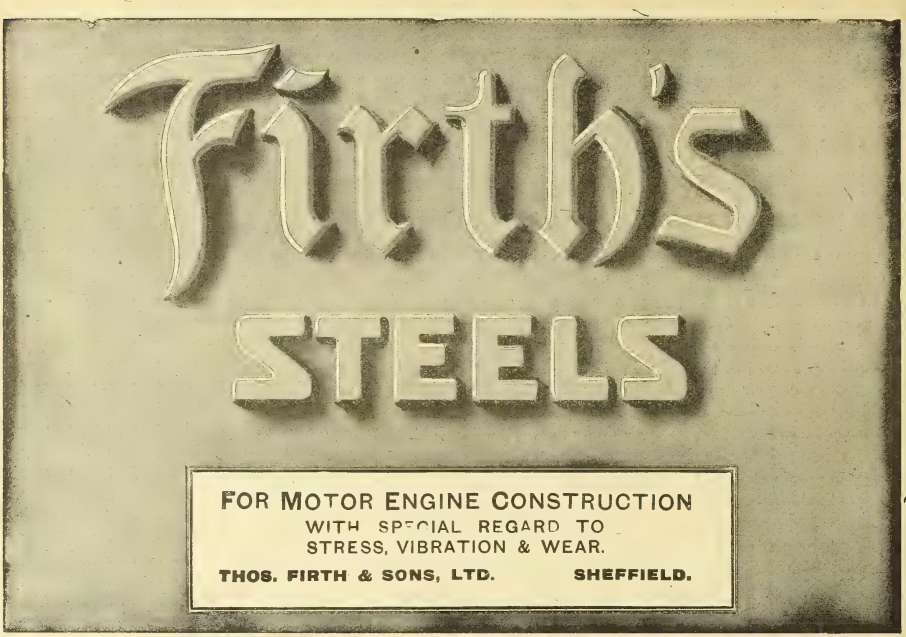
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placed under the centre section and over the centre of gravity, the pilot being seated in front astride the propeller shaft.

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Two wing-tip floats are fitted as additional stabilisers when the machine is resting on the sea.

SPECIFICATION.

Type of machine	Biplane.
Name or type No. of machine	W.B. IV.
Purpose for which intended	Ship's Scout.
Span	Top 35 ft. 10 ins., bottom 35 ft.
Gap	4 ft. 9 ins.
Overall length	26 ft. 6 ins.
Maximum height	9 ft. 10.5 ins.
Chord	Top 6 ft. 3 ins., bottom 4 ft. 9 ins.
Total surface of wings, including ailerons	350 sq. ft.
Span of tail	11 ft. 9 ins.
Total area of tail	50.5 sq. ft.
Area of elevators	24 sq. ft.
Area of rudder	12 sq. ft.
Area of fin	8 sq. ft.
Area of ailerons	18.8 sq. ft. each, 37 ft. 6 ins. total.
Maximum cross section of body	12.5 sq. ft.
Horizontal area of body	73 sq. ft.
Vertical area of body	51 sq. ft.
Engine type and h.p.	Hispano-Suiza 200 h.p.
Airscrew, diam. and revs.	9 ft., 1,500 r.p.m.
Weight of machine empty	1,960 lbs.
Load per sq. ft.	7.5 lbs.
Weight per h.p.	13 lbs.
Tank capacity in hours	8.5 hours.
Tank capacity in gallons	37 gallons.
Performance—	
Speed low down	110 m.p.h.
Speed at 10,000 feet	102 m.p.h.
Landing speed	45 m.p.h.
Climb—	
To 5,000 feet	7 mins.
To 10,000 feet	18 mins.
Disposable load apart from fuel	340 lbs.
Total weight of machine loaded	2,600 lbs.

(To be continued.)

THE TARRANT ACCIDENT.

The accompanying photograph of the wreck of the Tarrant triplane on Monday, May 26th, at Farnborough, is of some importance, as bearing upon the cause of the accident.

Generally speaking, it has been considered that the opening out of the two upper engines, with a thrust line high above the C.G., caused the machine to turn over upon its nose. If this were the case, the failure of the lower centre section and the consequent displacement of the two chassis must have been caused by one skid digging into the ground.

An examination of the scale drawings of this machine (page 1960, THE AEROPLANE, May 14th) will show that the wheels are very little forward of the probable position of the centre of gravity, and that if the tail rose much above the horizontal the machine would tend to pitch on her nose.

The drawings also show that the internal bracing of the lower centre section is the only bracing holding the two separate chassis in line one with the other, and it seems possible that one chassis hit a bump on the ground and that this lower centre section failed, one chassis swung back, and the machine tripped over it.

This arrangement of two independent chassis held together entirely by the wing bracing has given serious trouble on much smaller machines than this, and it seems quite possible that it may have been the immediate cause of the accident.

At the same time the very great value of both the thrust moments and the inertia moments of the upper pair of engines, coupled with the by no means large elevator area and tail lever arm, added to the rather far back position of the landing wheels, makes the first theory perfectly plausible.

It must be regarded as distinctly unfortunate that so ingenious a form of construction as that developed by Mr. Tarrant should have been tested in a machine so abnormal in every way.

A preliminary test of the Tarrant type of girder, made by re-designing some standard type of machine for the new construction, would have exhibited the structural value of the new methods used without the running the risks attendant upon the trial of so large and so novel a machine.

ALL ABOUT AIRCRAFT REVIEWED.

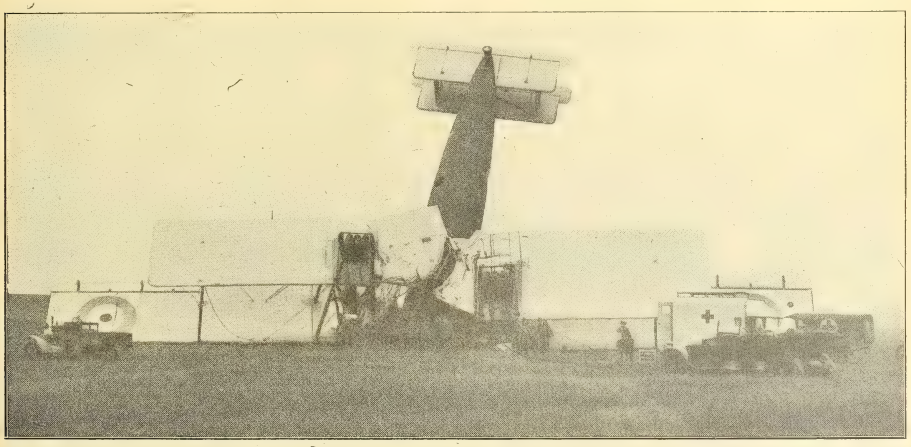
(By C. J. Blackburn and E. J. Newby. Simpkin, Marshall, Hamilton, Kent and Co 3s. 6d. net.)

The chief occupation of all the various people concerned with or interested in aviation would appear to be the making of books thereon. Practically every day a new one is published.

Among the latest books dealing with flying is a little book, "All About Aircraft." Exactly how the authors expect to get "all" about aircraft into 122 pages is not explained; indeed, only heavier-than-air craft are dealt with in the book.

All the best-known types of aeroplanes and aero-engines are illustrated, and a short non-technical description of each is given. Several short chapters on construction, stunting, and fighting, all liberally illustrated, appear in the front of the book, and a glossary of aeronautical terms and a system for the identification of certain aircraft is given at the end.

The book is worth the money to those whose knowledge of aeronautics precludes the possibility of their understanding a technical book.—S. F. B.



The Wreck of the Tarrant Triplane. Note the failure of the Lower Centre Section which has allowed one chassis to move backward.

LONGITUDINAL STABILITY IN PRACTICE.

A Practical Method of Design.

By C. W. TINSON, A.F.R.Ae.S.

(Continued.)

The Gotha twin-engine bombers have a stiffness ratio of only 92⅔, but from the published accounts of the machine it would seem that a number have been smashed when landing after raids over Britain, and with as low a ratio as this it is most likely that the machine would tend to drop out of the air if a very slow landing were attemped, and a tired pilot would, therefore, either land heavily or attempt to land too fast and damage would result.

The Cody machine in the Military Trials of 1912 had a large elevator in front, but the only tail in the real sense was the little "damper" plane, or horizontal fin, at the end of each rudder boom. The area of both these fins amounted to something like 10 square feet, on which figures the stiffness works out at 59.6.

In such a machine it would be necessary continually to adjust the elevator to maintain balance, the effect of the dampers being merely to reduce to some extent the pressure applied at the control column.

It was said that Cody was the only man who could fly the machine.

The first Wright machines had no tail whatever, and were supposed to be balanced at the position at which the C.P. would be at their flying speed, any displacement due to a gust being corrected by moving the elevator from its no-lift position—the position it was designed to occupy in the ordinary way. Having no tail plane that could be called fixed, there could be no stiffness ratio, which agrees with practice, for flying this machine was analogous to balancing an egg on its point.

The Wright Brothers afterwards rigged a tail plane on booms behind the wings.

One of the first decisions to be made in designing the tail is at what point shall the machine be balanced statically, i.e., where shall the vertical line through the C.G. cut the equivalent plane. This decides the load on the tail. In several of the earlier machines this point occurred fairly far back and a so-called lifting tail was employed.

Recent practice is to balance the machine well forward and to use a tail of symmetrical cross section, and it is well known that such a combination produces a much more stable machine, and if the combination be just right in every particular, a machine can be made to get off and land with no other control but the switch.

While the latter feature cannot come entirely under the designer's control, since the pilot's weight may shift the C.G. sufficiently to make it impossible on all occasions, an examination of the conditions obtaining in the two schemes mentioned will indicate where the C.G. should be to produce the best results.

In a machine balanced at 0.5 of the chord of the equivalent plane, it is clear that the C.P. and C.G. will coincide in a vertical plane at something around the maximum speed, and that at large angles of incidence a strong moment will be brought into play tending to stall the machine.

To overcome this moment the tail would have to be of colossal proportions, for its incidence to the relative wind at top speed would have to be zero, and it would therefore be fixed at +0° incidence at stalling speed—the downwash at top speed being +2° and at stalling speed +7°.

Without going into figures, the size of the tail would obviously be great, and since it would be at +2° to the chord of the wings in order to give no moment at top speed, it follows that at higher speeds it would throw the machine over on its back.

Clearly then 0.5 balance is dangerous and unpractical, even if the tail were large enough to hold up at stalling speed.

The opposite case is when the C.G. in static balance corresponds to the most forward position of the centre of pressure, which in most wing sections is in the neighbourhood of 0.31 of the chord.

If the C.G. be in this position there will be a couple tending to drop the nose of the machine at all speeds except stalling speed, where there will be no moment.

Now the machine should fly "hands off" at its top speed, unless for some special purpose, such as flying for long duration at the speed of minimum fuel consumption, it is required to trim at some speed less than the maximum. The requirement to be satisfied, therefore, is that the tail be of such area and angle that it exerts a moment at top speed equal to the weight of machine multiplied by the distance from C.G. to C.P. when the latter is at the point corresponding to top speed incidence.

Further, the tail plane must raise the nose if the speed increases beyond normal and must raise the tail at lower speeds down to stalling speed to prevent pancaking.

The tail area and angle are inter-dependent, and as the angle at stalling speed is required to be positive and as large as possible, it follows that a very small dihedral will best satisfy the condition at low speeds.

At the same time, there must be a dihedral of definite value or it will be impossible to satisfy the other condition, namely that the nose shall come up at speeds in excess of the normal.

Cutting the dihedral too fine may result in instability at a speed higher than the normal maximum when a condition may exist tending to throw the machine over on its back, and it is believed that this has actually happened in practice, the machine being stiffer upside down than it was the right way up.

It is clear that to fix the dihedral another factor must come in, a consideration unconnected with static balance, but sufficient has been said to show the virtue of balancing at the forward or slow speed end of the C.P. travel.

Arranging the balance at a point ahead of this limit merely imposes more load on the tail plane and is therefore wasteful of weight, unless the dihedral is increased instead of the area and an increase of dihedral makes the righting moment smaller at low speeds.

Since it is impossible to guarantee the position of the C.G. exactly, and a certain amount of tolerance must be allowed, the C.G. should be taken at either 0.29 or 0.34, whichever gives the worst case, in designing the tail. These limits give a little greater latitude aft of the correct position and are suggested for an ordinary land machine or seaplane; for a flying-boat, in which the thrust is high, the greater latitude should be allowed in front of the estimated position, as it is required to include the thrust moment in the weight moment by allowing a sufficient tolerance.

It has been said that a consideration unconnected with static balance must actually decide the amount of dihedral given. This requirement is really of a threefold character. Firstly, the combination of area and angle must be such that the machine flies hands off at the maximum, or some predetermined, speed, and this can be effected with a large area and a small angle, or vice versa.

Secondly, the moment tending to hold the tail up at stalling speed must be as large as possible. Thirdly, there must be a moment at speeds higher than the normal maximum such that the machine, if let alone, will come out of a dive. The consideration governing the combination of area and angle is the loading on the tail plane. It is reasonable to assume that if a similar type of construction is used in the tail to that in the wings, the maximum normal loading on the tail should not exceed that on the wings, but in view of the enormous increase of tail loading when nose diving, it is strongly recommended that tail loading at normal top speed should not exceed 5 lbs. per sq. ft.

By determining the loading, the tail area can be obtained straight away by finding the pressure required on the tail at normal top speed and dividing by this value for normal loading.

The angle to the relative wind can then be obtained by introducing this area into the usual expression for lift, using the v^2 corresponding to normal top speed.

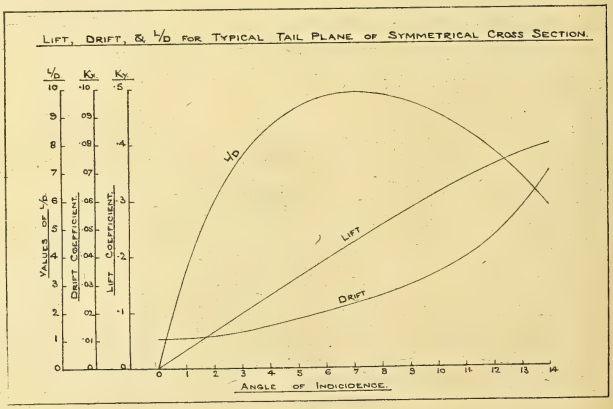


Fig. C.

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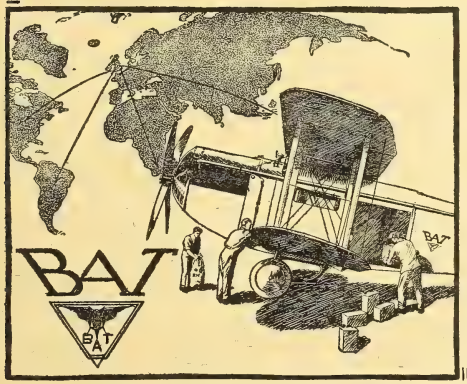
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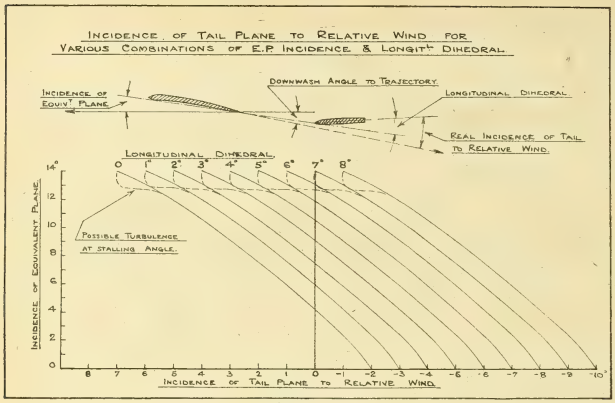


Fig. D.

For example, suppose the tail area and angle are required for a machine of which the following are characteristics :—

W. Weight of machine .....2,875 lbs.
C Chord of wings .....5.5 feet.
V. Normal maximum speed .....97 m.p.h.
Angle of equivalent plane at speed V .....0°.
C.P. position at speed V .....0.5 chord.
No-lift angle of equivalent plane .....—3°.
Stalling speed .....45 m.p.h.
L Leverage of tail about C.G. .....15.75 feet.
Limiting nose-diving speed .....175 m.p.h.
Distance C.G. to centre of resistance ...1.25 feet.

The tail pressure required at normal top speed will be a maximum when the C.G. is at its most forward limit. Taking the range of possible positions of the C.G. as from 0.29 to 0.34 of the chord of the equivalent plane, the tail pressure at top speed is :

$$P = \frac{W\ (.5 - .29)\ C}{L}$$
$$= \frac{2875 \times .21 \times 5.5}{15.75}$$
$$= 211 \text{ lbs.}$$

Specify the loading at top speed as say 6 lbs. per square foot. The area of the tail plane will then be :—

$$A = \frac{P}{\text{Loading.}}$$
$$= \frac{211}{6}$$
$$= 35.2 \text{ sq. ft.}$$

Should the C.G. be behind 0.29, the pressure required will be slightly less than 211 lbs, and the hands off or trimming speed would actually be a little below the normal top speed with the area thus obtained, but it will be found that a fractional decrease in longitudinal dihedral is sufficient to correct this if it is desired to trim at the top speed value.

The area thus fixed, the angle to the relative wind can be found by substituting this value of A in the usual expression for lift, using the v^2 corresponding to top speed V.

Thus in the example :—

$$Ky = \frac{P}{P/\rho\ A\ v^2}$$
$$= \frac{211}{.00237 \times 35.2 \times 20300}$$
$$= .125$$

whence the angle, on the assumption that the tail is similar to T.P.4 is found from the curve of Ky values to be 3.8°. The longitudinal dihedral is found by substracting the downwash angle at top speed incidence of the equivalent plane from the angle of the tail to the relative wind, and adding the incidence of the equivalent plane if any.

On reference to the curve (Fig. D) the downwash angle will be found to be 2° in this case and therefore

$$\text{Dihedral} = 3.8° - 2° + 0$$
$$= 1.8°$$

Having settled the combination of area and angle for trimming at top speed, the condition of stability and loading on the tail in a nose-dive at limiting speed should be examined, for if the loading is too high under these conditions a lower value will have to be substituted and new values obtained for area and angle.

In a nose-dive at limiting speed the assumption is that the planes are at their angle of no lift, consequently the upsetting couple is not due to lift and weight, but to weight and head resistance, which will be tending to turn the machine on its back if the centre of head resistance comes below the C.G.

In the usual type of aeroplane, this couple will be found to assist the tail moment, but assuming that it were not so in the example and that the weight of the machine had a leverage of 1.25 feet, the weight moment would be :—

$$2875 \times 1.25$$
$$= 3592 \text{ foot lbs.}$$

This moment must be overcome by the tail which will be running at an angle equal to the no-lift angle of the wings plus the dihedral, assuming that there is no downwash when the wings are not lifting, which seems reasonable.

If the angle of no-lift be —3° in the machine under examination, and the dihedral corresponding to 35.2 square feet of tail is 1.8° the tail will be running at —4.8° at 175 m.p.h. giving a righting moment of :—

$$P/\rho\ Ky\ (-4.8°)\ A\ v^2\ L$$
$$= .00237 \times .155 \times 35.2 \times 256.8^2 \times 15.75$$
$$= 13400 \text{ foot lbs.}$$

This is greatly in excess of the weight moment and if the loading in this condition is not excessive, the tail can be said to be satisfactory in diving.

The loading will now be :—

$$\frac{13400}{35.2 \times 15.75}$$
$$= 24.16 \text{ lbs. per sq. foot.}$$

or 4.025 times the normal loading.

If the tail be designed for the usual factor of safety of 6, there would be a little in hand, but not nearly enough to satisfy the usual requirement of 2.5 factor of safety in diving asked for on wing structure.

It is true that, in practice, the elevators would have to be used to produce and maintain the attitude assumed and because their inclination practically converts the tail into a cambered surface, much of the top pressure disappears, and is limited, if it exists at all, to the nose of the tail plane and leading edge number.

However, if the controls are suddenly let go and the tail has to pull the machine out of the dive by itself, the case taken is rational, especially in a seaplane where the centre of resistance is brought down by the floats in a dive. (Fig. E).

In a land machine of the ordinary type the weight moment very often assists the tail in restoring equilibrium, but the fact cannot be got away from that under conditions that are temporarily possible, the loading on the tail may reach a very much higher value than its normal, by virtue of the fact that it is being forced through the air at a certain negative incidence at a very high speed, and that, unlike the main planes, it cannot adapt its angle to the speed but is bound to follow the planes at the altitude governed by the incidence and the fixed longitudinal dihedral.

Further to emphasise the importance of this point in tail design, suppose that for some reason the machine is out of balance on its first flight and the dihedral is increased by 1½° to make the machine trim.

In diving, the tail will now be at -6.3° and the loading, instead of being 24.16 will increase to 31.62 lbs. per square feet, or 5.27 times its normal.

If the tail be designed for a factor of 6 it will be very near collapsing.

To provide against such a possibility the range over which the C.G. is allowed to occur should be ample, which in conjunction with the method of finding the characteristics of the tail outlined in these notes will give such an area that the adjustments to the angle which may be necessary after the first flight will be so small that overloading need not be seriously considered.

The next case to receive consideration is the state of affairs existing when the tail is at its position of zero incidence to the relative wind and is therefore giving no moment at all.

For the worst case in this instance, the C.G. should be taken at its rearmost limit, say 0.34 of the chord, for if the angle of the main planes corresponding to no-lift of the tail is such that the C.P. is ahead of 0.34 there will be a risk of the tail dropping when climbing.

Reference to the curve of Real Incidence of the tail shows th

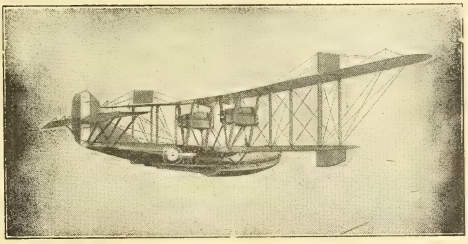


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the no-lift position for a tail set at 1.8° dihedral occurs when the main planes are at + 7.3° incidence, at which angle the C.P. in an average wing section would be at approximately 0 35 of the chord.

This is behind the rearmost limit of the C.G. and so the nose will be dropping, which is what is wanted.

Finally there should be an overplus of righting moment at stalling speed to prevent the tail "sitting down" when landing slowly, and to avoid sudden loss of speed with the subsequent pancake.

Here again the worst case for the tail will be if the C.G. is back at its most rearward limit, for if it were at 0.29 or even at 0.31 there would be no weight moment of any consequence owing to the C.P. and C.G. practically coinciding.

At stalling speed, if the C.P. is at 0.31 of the chord, the maximum possible stalling moment in the example is :—

$$\begin{aligned} & W\ (.34 - .31)\ C \\ = & \ 2875 \times .03 \times 5.5 \\ = & \ 474.5 \text{ foot lbs.} \end{aligned}$$

Referring to the table of Incidence of Tail Plane to Relative Wind, a 1.8° dihedral gives -5.1° incidence at stalling speed, i.e., 14° incidence of planes.

The speed being 45 m.p.h. there will be a righting moment of :

$$\begin{aligned} & .00237 \times .165 \times 35.2 \times 4350 \times 15.75 \\ = & \ 943 \text{ foot lbs.} \end{aligned}$$

This shows a good margin of righting moment.

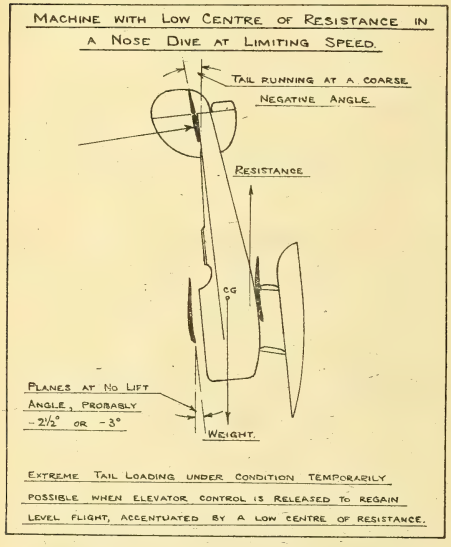


Fig. E.

The amount by which the righting couple should exceed the weight moment at stalling speed is a question connected with "stiffness," and if the relative stiffness worked out by the method used in obtaining the values tabulated earlier in these notes is something over the value indicated as an average, namely 300, the tail calculated in the example can be adopted.

$$\begin{aligned} \text{Modulus of Stiffness } S = & \frac{A\ L\ V^2}{W\ C} \\ = & \frac{35.2 \times 15.75 \times 97^2}{2875 \times 5.5} \\ = & \ 330 \end{aligned}$$

This value compares favourably with machines known to be nice to handle, but raising it would lighten the loading on the tail in a dive, the only doubtful quantity in the example worked out.

Regarding the adjustment of the tail in flight to trim the machine at speeds other than top speed, the least dihedral will be given by the top speed angle worked out on the assumption that the C.G. is at 0.29 of the chord.

If the C.G. be behind 0.29 as it should be if weight estimates are correct, there will be a little in hand to prevent the machine going downhill with hands off.

The bottom limit will probably be such that the machine can be flown hands off at about half throttle.

In the example, let the machine be trimmed to fly hands off at 55 m.p.h., at which the incidence of the planes is, say 8°.

The C.G. should be taken at 0.29 so that the pressure required on the tail works out at its highest probable value. There should then be a little to spare when flying hands off at this speed which will ensure the range of adjustment given being adequate.

The C.P. at 8° will be at 0 342 of the chord, and if the C.G. is at 0.29 the pressure on the tail required will be :—

$$\begin{aligned} P = & \frac{W\ (.342 - .29)\ C}{L} \\ = & \frac{2875 \times .052 \times 5.5}{15.75} \\ = & \ 52.3 \text{ lbs. (downward).} \end{aligned}$$

The angle of the tail to the relative wind for this pressure works out at —2.65°.

Referring to the curve, —2.65° actual tail incidence and 8° incidence of the equivalent plane gives a dihedral of 5°.

The adjustment provided therefore should be from 1.8° dihedral to 5° or 5.5° dihedral to cover all possible requirements.

With regard to the top speed limit to the tail adjustment, it is believed that in some cases this has been fixed to allow the machine to exceed its normal top speed with hands off the controls, with the object of diving with both hands free, but while this might have been necessary in war, there is nothing to be gained by it in the ordinary way, for the decrease in total resistance will not be great.

Beyond a certain point it might be necessary to wind the tail back to get out of the dive, the elevators being overpowered and it would therefore appear that the high speed end of the limit to the adjustment should correspond with the angle found in conjunction with 0.29 balance.

In conclusion, it is hoped that this method of dealing with the design of the tail plane by "worst cases" and of solving for its area by the loading method may be of some assistance, and tend to simplify the problem and cut short the time that would otherwise be spent in calculations of an exceedingly intricate nature.

NEW ITALIAN MACHINES.

At the last general meeting of the Macchi-Nieuport firm it was stated that nearly every concern building aircraft here had contracts on hand for turning out Macchi seaplanes at the time of Austria's collapse.

The Fiat-Sia Atlantic attempt preparations are well ahead, and the machine is ready for its trials. It is hoped to carry 2,500 kilos. of petrol and to attain a speed of 250 kms. per hour. The type is the Br., and the engine is a Fiat A.14, specially tuned.

It seems only too true that three Liberty engines are being fitted to the C.A. 1,200 h.p. triplane built here. By-the-bye, one of these big machines which carries twenty passengers comfortably will very probably be touring to England shortly. There was talk of one of the tiny 300 Fiat-engined C.A. triplanes making a non-stop voyage from Turin to London with two pilots only on board.

RIGID AIRSHIPS.

Four rigid airships of greater size than the R.33 and the R.34 are under construction. It is understood that their completion is expected by the end of the year.

Success in long-distance flying chiefly depends on the efficiency and reliability of the engines, which, in the case of the latter rigid airships built or building for the Admiralty, are of Sunbeam-Coatalen design. Two of the ships are fitted with four 350 h.p. "Cossack" type engines, while the two others, in addition to having a similar number of "Cossack" engines, are equipped with two "Maori" engines of 250 h.p. each, making a total of 1,900 h.p. for each airship.



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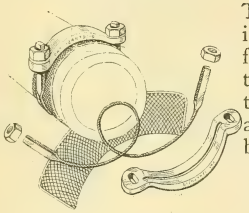
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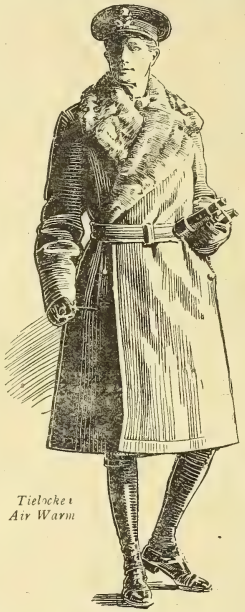
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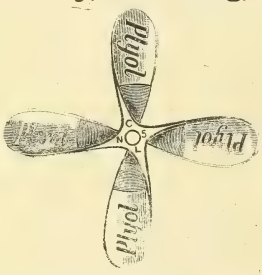
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MARKET TOPICS.

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COPPER.—The recent activity in this market does not indicate that consumers are at last showing a healthy interest in the metal, but it looks as though stockholders were behind the movement; the quantities purchased by actual consumers are only small, and they are apparently still buying hand-to-mouth. The production still exceeds the demand, and large stocks must be held in various parts of the world, and it is stated that immediately Peace is signed offers of Copper will be very freely made, particularly to the Central Powers.

Some of the estimates of the demand which is likely to come from the latter have certainly been exaggerated; on the other hand, there is bound to be a fair demand from them; this feature of the market is influencing American sentiment, and the general impression is that the revival of industry is not far away. There is at present no selling pressure, as there is a strong feeling in U.S.A. that values will harden when consumers begin to show activity.

COMPARATIVE PRICES.

	Per Ton.
To-day May 28th	£ 79 5 0
Last week	79 7 0
Last year	110 5 0
Lowest Price, 1918	100 0 0

TIN.—There has been a reaction in this market since Tuesday last, and prices have declined from £247 to £233 on Friday. The position is very uncertain, and the market continues very sensitive. There is, in fact, no sign of stability; the demand is very spasmodic, and consumers are still in a waiting attitude. The position in America is unchanged, and the market continues in a state of stagnation.

The outlook is very uncertain, but it is not expected that there will be any serious decline in price. At the same time the present price, although not unreasonably high, cannot be considered low.

COMPARATIVE PRICES.

	Per Ton.
To-day, May 28th	£236 6 0
Last week	245 7 0
Last month	226 12 6
Average price, 1918	329 10 0

LEAD.—The activity which was being witnessed amongst consumers received a sudden check last week, when the Government announced a reduction in the price of their Lead of 20s. per ton. The first effect of this announcement was to scare buyers, and they have not yet fully recovered, so the business done during the past week has been very small. It is understood that large stocks are available, the stock in Australia being approximately 80,000 tons. In sympathy with the reduction in the price of Pig Lead, the prices of Lead Pipes and Sheets have been reduced 20s. per ton. Sellers were offering Lead on Monday at £23 5s.

STEEL.—This market continues very unsatisfactory, the general opinion is that the prices quoted at present are too high and must decline. On the other hand, manufacturers state that this is impossible, and although there is a fair demand for certain classes of Steel, the majority of buyers are living hand-to-mouth and are awaiting developments. The position is so uncertain that few firms will quote for delivery after June unless all kinds of price reservations are made. American firms are still busy, and it is stated that they have recently taken some large orders from India, the approximate total being about 10,000 tons. It is understood that British makers lost the order owing to the prices being high.

There has been a substantial reduction in the prices of Swedish Iron Ore, and there should now be a further reduction in the prices of Crucible Cast Steels.

TIMBER.—The Timber market is at the present time very firm, if anything, there is an upward tendency. This is particularly noticeable in the Hardwood market. The keenness shown by buyers at the recent sales is particularly healthy, and this market is becoming stabilised. The demand is active, and prices which are fairly reasonable continue firm.

At one recent sale a quantity of Mahogany of Aeroplane quality did not attract any buyers, prices being too high. The Timber had apparently been bought on a high market. The demand for all classes of Timber for Aeroplane construction continues dull, and there are at present no signs of a revival; in fact, everything indicates it will be some considerable time before there is any activity possible by buyers of Aeroplane Timber.

Aeroplane constructors who suffered dislocation of output due to inferior Silver Spruce substitutes will be interested in the questions which have been asked recently by Mr. Remer, who is a well-known timber merchant. The following questions were asked last week-end by this gentleman. Questions and answers are given below:—

In the House of Commons during the week-end Mr. Remer asked the Secretary of State for War how many machines, manufactured and partly manufactured, had to be discarded owing to cypress being found an unsuitable wood for use on aeroplanes?

Major-General Seely: No machines had to be discarded for this reason, but the substitution of other woods involved the supply of about 900 main planes, 100 main spars and 55 tail planes for machines on charge of the Royal Air Force. Substitutions were also required for machines in the hands of contractors, and particulars of these are being sought for in accordance with the undertaking given to my hon. Friend in answer to his previous question on this subject.

Mr. Remer asked the Secretary of State for War if he will give the names of his present advisers as to the most suitable woods necessary for use on aeroplanes; what were their pre-war occupations; and what practical experience of sawing and manufacturing Timber they possess?

Major-General Seely: The Timber Committee of the Conjoint Board of Scientific Societies, in connection with the Royal Society, advises on the suitability of Timber for Aeroplanes. I will send my hon. Friend a list of their names.

ACCUMULATOR RATINGS.

Some ten years ago the Committee of the Accessories and Components Section of the Society of Motor Manufacturers and Traders issued some rules for accumulator rating, which were reviewed and revised in 1918, and the Society have accordingly issued an explanatory article by Mr. Wm. Peto on this subject, from which the following has been extracted:—

When accumulators first came into use for the purpose of supplying current for sparking plugs, in conjunction with an induction coil, they were mostly imported from France, where a practice existed of marking the capacity at a value double that which could actually be obtained if they were discharged continuously. This practice was copied by British manufacturers, as the distributing trade had become accustomed to these values.

The current actually taken by an induction coil is not only intermittent, but it is impossible to state what amount is taken, and it is impossible to gauge the value of these excessive claims for output or capacity under ignition conditions.

When accumulators began to be used for the purpose of supplying current to lamps taking definite quantities of current continuously, it became important. Accumulators sold as having a capacity of 60 ampere hours for ignition work would probably give 30 ampere hours if discharged at 3 amperes for 10 hours, lighting, for example, two side lamps and tail lamp.

The buyer, however, would be under the impression that 60 ampere hours could be obtained, equivalent to 3 amperes for 20 hours. The chief point considered was as follows:—

No value for the capacity of an accumulator is of practical use unless it is stated at what rate current is assumed to be taken from the cells. For example, an accumulator of 30 ampere hours would give this output if discharged at 3 amperes for 10 hours, but if discharged at 30 amperes for one hour, only 50 per cent. of the normal output would be obtained, namely, 15 ampere hours.

As motor-car cells are discharged at moderate rates with frequent intervals of rest, the Society of Motor Manufacturers and Traders standard rate of discharge was taken as being 20 hours, with an interval of rest or time for recovery half-way through the discharge.

The rule for accumulator rating is therefore as follows:—Accumulators shall have printed on their labels their actual capacity when discharged continuously at one-twentieth of the capacity claimed. An interval of rest to be allowed, such interval not to take place until half the period of discharge has expired.

During the past year this important subject of accumulator capacity has also been fully considered by the Portable Battery Makers' Section of the British Electrical and Allied Manufacturers' Association.

Their standard capacity curve has been considered by the Accessories and Components Committee of the Society of Motor Manufacturers and Traders, who have agreed that figures for capacity based upon the 20 hour figures in this B.E.A.M.A. curve are acceptable as true values for capacity at 20 hour rate.



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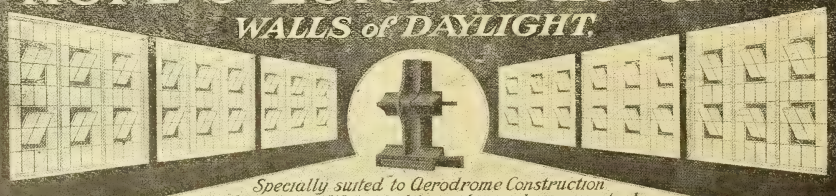
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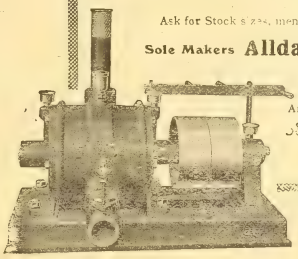
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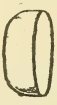
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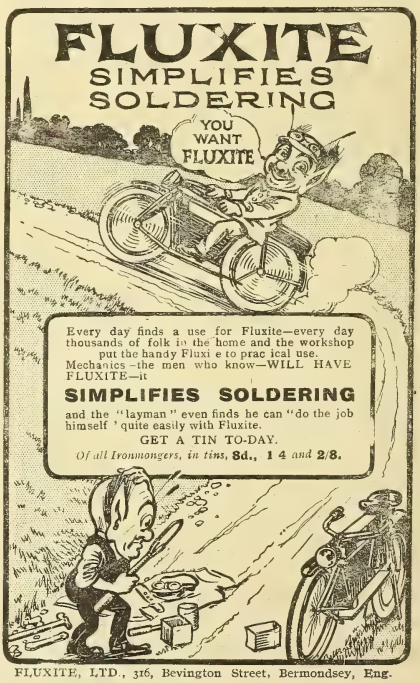


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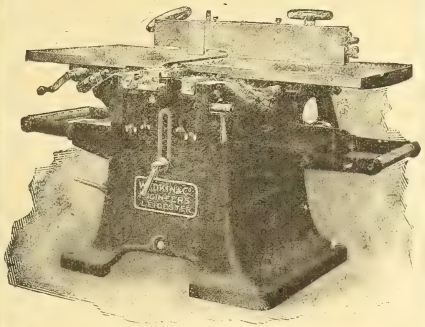
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I take the following quotation from a recent issue of an evening paper:—

"The Aero Club of America announces that Capt. d'Annunzio, aeronautical engineer, son of the famous Italian poet-aviator, is engaged in manufacturing aeroplanes with a wing spread of less than 20 feet, and thus capable of landing in streets. It is to sell for £240.

"Capt. d'Annunzio has been in the United States more than a year, in charge of construction of Caproni aeroplanes for the United States Army. The new machines which he has designed are guaranteed to fly two and a half hours. It is announced that members of the Aero Club have placed orders for several of these new machines."

I take it that the journalist and not the engineer is responsible for the last sentence but one. No doubt it is intended to mean that the machine will keep the air for 2½ hours. At the same time it *does* mean that 2½ hours is to be the life of the machine.

Useful Deductions.

From a trivial mistake of this kind some serious and perhaps useful deductions may be drawn. It leads one to a line of thought that is not uninstructive. Do we want very cheap aeroplanes to be produced at present, particularly if, in order to secure cheapness, we must sacrifice some degree of durability? In other words, is cheapness in first cost a factor which can exert sufficient influence to make it worth our while to give it much attention until we have got several stages nearer perfection?

Let us take a few rough figures. Assuming that we started services with machines costing four thousand pounds each, and having an average life of three thousand hours in the air, the depreciation in the value of the machine during each flying hour will then be £1 6s. 8d. Suppose that the average speed is a little over a hundred miles an hour. Then we have to depreciate at the rate of 320d. for every journey of a little over a hundred miles. This works out at about 3d. a mile.

Now I take it that most people will agree with me that it is not at all likely to pay to run such a machine unless the receipts can be estimated at 7s. or 8s. a mile. If we take the latter figure, then our depreciation allowance is only just about 3 per cent. of the total receipts on which we have to reckon.

Supposing we manage to halve the cost of the machine without in any way reducing its durability or efficiency, we should be able to work at a profit on receipts about 1½d. a mile lower. Even in this extreme case we are aiming at something which is hardly worth attempting.

Durability and Efficiency.

Moreover, it is more than questionable whether the halving of the first cost would not inevitably affect durability or efficiency. With petrol at half-a-crown a gallon, a difference in consumption of 1½ gallons for every 30 miles would neutralise the whole of the savings under the heading of depreciation, assuming the cheaper machine, of course, to be less economical.

If by halving the first cost we also halved the durability, we should gain nothing whatever, even under the heading of depreciation, and we should probably lose under all other headings.

It is quite wrong to regard first cost as a lump sum. It should really be reckoned always simply and solely as cost of depreciation, to which, if we wish to be very accurate, we must add an allowance corresponding to a reasonable rate of interest upon the money expended. When we have entered both these items, the figures of first cost, as such, need no longer be considered.

The First Cost of Machines.

In point of fact, the first cost of machines used would represent only a very small fraction of the total expenditure necessary in order to finance a service and to provide the ground organisation needed in connection with it. I take it that nobody would at present suggest economising in the ground organisation. We all agree that we must have the best possible devices to assist navigation and to enable the pilot to overcome difficulties and dangers occasioned by fog and by unreliable weather.

The organisation for repair and maintenance must be as perfect as possible, otherwise we shall suffer delays which will bring the service into disrepute.

Our first duty is to prove reliability and safety. When that has been done conclusively, we can get down to the process of fractional monetary savings. Until we have proved our case on the main issues, it would be folly to do so.

I do not mean that we should make no attempt whatever to eliminate unnecessary expenditure in the manufacture of machines. We have to formulate a commercial proposition, and we must certainly do so on commercial lines, which are not consistent with deliberate waste.

My point is rather that, if I were advising on the establishment of a service, I should certainly recommend that there should be no attempt to economise in the cost of any portion of the machines themselves if the makers are of opinion that economy can only be obtained at the cost of some sacrifice of durability or efficiency.

Undesirability of Standardisation.

I wrote the other day on the subject of the undesirability of attempting to standardise for some years to come. The whole argument in favour of standardisation is that, if achieved, it would result in certain economies. The difficulty in tackling any broad subject of this kind is that it is almost impossible to emphasise a principle without appearing to go to an extreme. Standardisation and the lowering of first cost are both admirable objects, provided that they are not carried to excess. My argument is that we are in much more danger of going too far in such matters than of failing to realise their importance.

On the question of first cost, let us take a rough analogy from the motor-'bus. The life of such a vehicle should certainly not be less than a hundred thousand miles. It ought to be considerably more, but we will take this figure. Suppose that the 'bus costs a thousand

pounds, we have to allow for depreciation at the rate of £1 for a hundred miles, or about 2½d. a mile. Suppose we reduce the cost to £750, we reduce the depreciation allowance by about a quarter, or not much more than ½d. a mile. The total cost of operation may be somewhere in the neighbourhood of 1s. a mile, so that a reduction of about 25 per cent. in first cost only corresponds to a reduction of four or five per cent. in operating costs.

Running Costs.

It may easily happen that in reducing our first cost we shall reduce slightly the efficiency of our engine. Suppose that the better engine would take the vehicle ten miles on a gallon of petrol at half-a-crown a gallon. The petrol cost would be about threepence a mile. Suppose that the inferior engine would only travel eight miles to the gallon, the petrol cost would be nearly fourpence a mile, and the result would be that the cheaper machine would result in a worse balance-sheet, because the extra cost of fuel would more than balance the reduced depreciation allowance.

This illustration may be serviceable because it is taken from a well-known system of transport, the costs of which have been thoroughly analysed for years past. Despite these facts, there are still many purchasers of commercial and public service motor vehicles who remain obsessed with the idea that the thing which matters most, and almost the only thing which matters at all, is a reduction in the first cost of the vehicle. There never was a bigger mistake, and I sincerely hope that the same error will not be made in the early stages of the development of commercial aeronautics.

THE AERIAL FUEL OF THE FUTURE.

Under the above heading one, "Medway," sets forth in The Aeroplane, of May 24th, reasons why alcohol should be regarded as the fuel of the commercial aeroplane of the future.

The arguments which he advances as evidence that some source of fuel supply must be found other than the existing petroleum fields are sound and unanswerable.

His contention that alcohol is the solution of the difficulty is as certainly untrue, particularly in regard to aircraft.

Alcohol, like all other possible fuels, is a compound of carbon and hydrogen, and it is upon the carbon and hydrogen content that its heating value, and therefore its power value, depends.

Roughly, pure alcohol consists of 53 per cent. by weight of carbon, 13 per cent. of hydrogen and 35 per cent. of oxygen.

The oxygen content is chemically combined with part of the hydrogen. From the fuel point of view this may be considered as meaning that one third of the hydrogen content of alcohol is already burnt, and has combined with the oxygen to form water, and that this water forms nearly 40 per cent. of the total weight of alcohol.

The petroleum type of fuel contains from 1 to 3 per cent. by weight of oxygen only, and practically the whole of the carbon and hydrogen content is useful fuel.

As a result the heating value of alcohol is roughly 11,500 British Thermal units per lb. of fuel, against 18,000 to 20,000 for oils of the petroleum series.

This means that for the same engine efficiency the fuel consumption per h.p. hour of alcohol will be as 18 : 11.15 or as 1.53 to 1 compared with the consumption of a poor fuel of the petroleum type. Actually the alcohol engine can be made rather more efficient than the petrol engine, but 18,000 is a low figure for petrol.

For the commercial car this is unimportant.

For commercial aircraft it is of immense importance.

It will, for instance, reduce the maximum ton mile capacity of aeroplanes by about 35 per cent.

Apart altogether from this aspect of the problem alcohol shares with petrol the qualities of great volatility and ready inflammability. These are essential features of any fuel for engines of the type now used in aircraft. In consequence, the fire risk on aeroplanes is now very great, and will continue to be so if alcohol is used.

A number of competent engineers who have studied the question hold that it would even now be possible to design engines of large power—750-h.p. and upward—working on heavy oil, which would compare favourably with the petrol engine of to-day on the weight per h.p. basis. The fuel consumption of such engines would be, if anything, lower than that of the petrol engine, and the fuel would be of a cheaper grade.

The risk of fire with such fuel would be small, since it would be neither volatile nor readily inflammable.

Therefore before deciding to stake the future of commercial flying upon schemes for the development of new sources of fuel supply it is rather important to consider whether such schemes will be able to supply fuels which may be demanded in the near future.

Neither alcohol nor any of its immediate derivatives possess the necessary qualities for use in the "heavy oil" type of engine.

Liquid hydro-carbons with fuel qualities similar to those of the petroleum series can be produced by distillation from an enormous number of organic substances.

Coal, shale, peat, and wood, distilled in a retort similar to the gas retort which produces the town gas of commerce will all produce hydro-carbons of a full value approximately equal to that of petroleum, and in all probability any substance from which alcohol can be produced by fermentation would yield a better fuel if subjected to a suitable distillation process.

Before the outbreak of war a process of coal distillation had been developed in this country—naturally enough by a gentleman of German birth and of the name of Müller—in which, by the control of the temperature and pressure of distillation a very large variation in the nature of the distillate can be secured.

In addition to the normal yield of coke, gas suitable for gas engines and tar, somewhere between 25 and 40 gallons of oil per ton of coal could be obtained. The nature of the oil produced could be varied at will from about 25 per cent. of a fuel corresponding in its qualities to petrol, with 75 per cent. of heavier oils, to a mixture entirely composed of heavy oils and containing a very small amount of volatile matter.

It is understood that the Admiralty showed no particular interest in this process till well on in the war, when Mr. Müller was removed to some far off part of the country, and set to work upon the experimental distillation of peat.

What results he has obtained are not known, but it is known that quite a good yield of fuel oil can be obtained from peat.

This being the case it is probable that fuel oils can be distilled from almost any vegetable matter such as, for instance, sawdust and shavings, and if the nature of the oil yield can be controlled in the manner indicated above, then there is a source of fuel available which will supply either the volatile fuel necessary for the aero-engine of to-day, or the heavy fuel for the engine of to-morrow.

The coal yield of England is roughly 200,000,000 tons per annum. Distilled, this will provide round about 50,000,000 gallons of oil of varying grades, and the remaining products, coke, gas, etc., used in economical furnaces, and power plants could supply more than the total heating and lighting demands of to-day.

If all the other possible sources of oil were treated by similar processes the effective fuel resources of the Empire could be trebled.

It is thus that the aerial fuel of the future is to be sought.

FICTITIOUS FIGURES ON FLYING.

The following letter has been received :—

Sir,—In your issue of May 21st, "Commonsense" attacks the figures given both by "Engineer Officer" and by myself in connection with the cost of aerial transport.

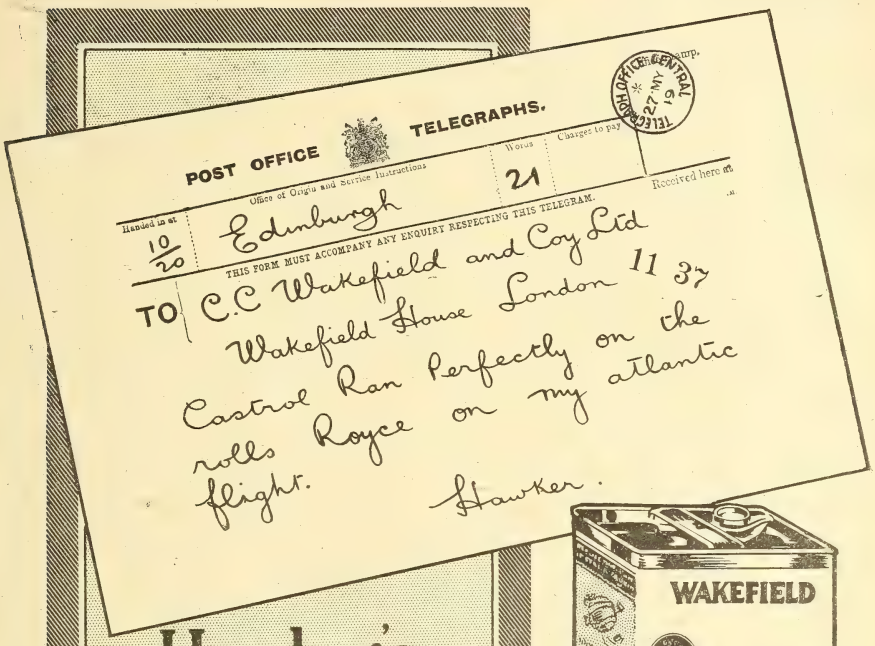
In the main his quarrel with my figures is based on the actual capacity of the assumed machines to carry the required loads at the speed necessary to run to the schedule, and upon the alleged impossibility of flying day and night on 300 days in the year.

So far only two specific types of machine have been mentioned by name. I myself mentioned the Handley Page V/1,500 type, and "Commonsense" advances the Bristol Bomber. Neither of these machines is capable of running to "Engineer Officer's" schedule of 100 m.p.h. with the loads assumed. Nor were either of these machines designed for such a purpose.

It was perhaps not made properly clear in my letter that I did not contemplate using the existing Handley Page type for such a service. What I had meant to imply was that, given the power plant of the V/1,500 and a total loaded weight of 25,000 lbs., it ought to be possible to design a machine with fuel capacity for 6½ hours at 100 m.p.h. air speed, but with a paying cargo capacity of two tons, which would have a sufficiently high maximum speed to run to the 100 m.p.h. schedule. This can be done easily, though possibly at a sacrifice of the ceiling of the existing machines.

With regard to the possibility of flying on 300 days per year, I think this may easily be reached in many places outside of this country. There are no 5,000-mile routes available within the British Isles, and, flying eastward from Britain, the end of the first 500-mile stage will land one well outside the fog-bound area. Even in the present state of aerial route organisation I believe many 5,000-mile routes could be planned upon which the 300-day schedule could be run to.

Ex-R.N.V.R.

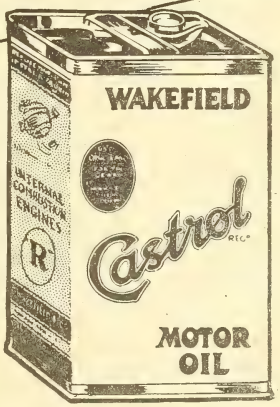


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CIVIL AERIAL TRANSPORT NOTES.

The first regular aviation meeting at Hendon since the war took place on May 31st and June 1st.

The meeting was arranged to celebrate the return of Mr. Hawker, who arrived at the aerodrome in a Sopwith "Gnu" (230 h.p. B.R. II.), with Mrs. Hawker in the passenger seat. He was met by many other machines, which formed an escort.

As there was a great demand for a flight with Mr. Hawker, 10 tickets were sold by auction, and the first was knocked down at 60 guineas to Miss Daisy King, of Leeds. Flight No. 2 was sold to Mr. Mansfield, of the Ascol Company, for 40 guineas, and the third ticket, auctioned by Mrs. Hawker, also fetched 40 guineas, which will be handed over to the Flying Services Fund. The remaining seven flights realised sums ranging from 10 to 20 pounds.

A highly interesting performance was put up by the new Boulton and Paul machine fitted with two 320-h.p. Dragonfly engines. This impressed the experts even more that it did the mob.

The big machine did not appear to run more than 25 or 30 yards before the wheels were off the ground, the rate of climb appeared to be extremely good, and it performed the most perfect loops one could wish to see. On Sunday the machine caused vertical gusts among the crowd by diving at great speed till within about 200 feet of the ground before flattening out.

This big twin-engined biplane was flown from Norwich to Hendon in one hour with three passengers. In appearance it is extremely attractive, and its performances in the air proved that it could stunt almost like a scout.

On Saturday afternoon the Vickers Vimy (two Eagle VIII. Rolls-Royce engines) arrived, having flown from Dartford to Hendon in 15 minutes. It was piloted by Capt. Stanley Cockerell.

The Vimy very nearly approaches one's youthful dreams of the flying machine. There are luxuriously upholstered seats for 11 passengers and a porthole by each seat. Ladies who crowded round it said it was "a dream," and some youthful scout-pilots thought the makers might have installed a silver grill and a jazz band to make it complete.

The machine is known as the "Commercial," and, except for the body, is identical with the one in which Capt. Alcock intends to make an attempt to cross the Atlantic.

Early on Saturday afternoon there was an accident to a Blackburn "Kangaroo" machine (2 Rolls-Royce Falcon engines), which resulted in Captain Robertson, the pilot of the machine, suffering slight concussion and extensive bruises, and Private H. Cox, of the 18th Canadian Reserve Battalion, sustaining a broken thigh.

The following interesting table appeared in the "Daily Telegraph" on Monday:—

"Some of the visitors, officials, and pilots at Hendon aerodrome yesterday and on Saturday must have thought of the last flying meeting held there on August 1st, 2nd, and 3rd, 1914. On the Bank Holiday the programme was entirely upset by war preparations and sudden Government orders. Some of the French aviators were already on the wing, bound for France.

"A comparison of the machines at Hendon on that occasion to those seen yesterday is extremely interesting. Then the following took part:—

Pilot.	Machine.
R. J. Lillywhite	Grahame-White biplane, 50 h.p.
W. L. Brock.....	Morane monoplane, 80 h.p.
Louis Noel.....	Morane monoplane, 80 h.p.
F. G. Dunn.....	Grahame-White biplane, 50 h.p.
A. E. Barrs	Grahame-White biplane, 50 h.p.
H. Salmet.....	Blériot monoplane, 50 h.p.
Birchenough.....	M. Farman biplane, 80 h.p.
E. Noel.....	H. Farman biplane, 80 h.p.

1919.

1. H. G. Hawker, Sopwith Gnu, 200 h.p. B.R.
   H. G. Hawker, Sopwith monoplane, 130 h.p. Clerget.
2. Capt. P. R. T. Chamberlayne, Grahame-White Bantam, 110 h.p. Le Rhone.
3. Clifford B. Prodger, B.A.T. Bantam, 170 h.p. Wasp A.B.C.
4. Major R. H. Carr, A.F.C., D.C.M., Grahame-White, 110 h.p. Le Rhone.
5. Capt. Cockerell, Vickers Vimy, 2-350 h.p. R.R. Eagle.
6. Capt. D. H. Robertson, A.F.C., Blackburn K, 2-350 h.p. Rolls-Royce.
7. Major C. Draper, D.S.O., B.A.T. Bantam, 170 h.p. Wasp A.B.C.
8. Lieut. Courtney, Boulton and Paul, ——
9. W. E. Birchenough, Airco D.H., 350 h.p. Rolls-Royce.
10. Lieut. G. R. Hicks, Avro, 110 h.p. Le Rhone.
11. Capt. D. Allen, Sopwith Gnu, 200 h.p. B.R.
12. Capt. Barnard, Sopwith Gnu, 200 h.p. B.R.
13. Capt. C. R. Vaughan, B.A.T. Bantam, 170 h.p. Wasp A.B.C.
14. Lieut. C. Turner, B.A.T. Bantam, 170 h.p. Wasp A.B.C.
15. Lieut. R. E. Duke, B.A.T. Bantam, 170 h.p. Wasp A.B.C.
16. Lieut. Louis Noel, Avro, 110 h.p. Le Rhone."

On Sunday, Lieut.-Commander Read paid a visit to Hendon, and of course was given a great reception. He witnessed a magnificent exhibition of stunting.

The Supermarine Programme.

The following extracts concerning the work of the Supermarine Co. are taken from a Southampton paper:—

The Supermarine Aviation Company, of Woolston, are completing their arrangements respecting the flying-boat service which they will inaugurate (subject to Government licenses being obtained in time) at Whitsuntide. It is the intention of the Company to concentrate on short flights with passengers. The latter will embark from the various pier heads at the Island towns, which will figure as stopping-places on the circular route which the seaplanes will cover. It is proposed that these places of call will include Ryde, Ventnor, Sandown, and Shanklin. The tour will extend to Bournemouth and Weymouth, and also later on probably to Le Havre and St. Malo.

One of the Supermarine Aviation Company's directors, Commander J. Bird, who was accompanied by Squadron-Commander B. S. Hobbs, D.S.O., D.S.C. and bar, visited the Island towns last week, settling final details with regard to the moorings.

Ten machines (each machine to carry three passengers) will comprise the service, and the same machine will not fly two days in succession, as the method will be for five machines to carry on in alternate squadrons of that number with a day in between for expert examination and regular overhauling of the machinery for the following day's flying.

On Sunday evening Squadron-Commander B. S. Hobbs, D.S.O., D.S.C. and bar, made an exhibition flight in one of the flying-boats, which proved thoroughly successful, and which was watched from the Royal Pier and along the Western Shore by interested onlookers. Squadron-Commander Hobbs has seen distinguished service during the war, and the Company is fortunate in retaining the services of such an experienced chief pilot. All the pilots who will take the flying-boats on the new service are ex-Royal Naval Air Service men, who have specialised in the type of machine to be used in the passenger service.

Flying in the North.

At Blackpool and Southport between 700 and 800 passengers were carried last week in three-seater Avros. The local service between Blackpool and Southport across the estuary of the river Ribble is very popular. The train journey takes well over two hours between these two towns, but by air the journey is completed in 10 or 12 minutes. Already business men are making use of the new means of transport.

Both aerodromes have been fenced off with rope and barricades (in the case of Blackpool by the Corporation), and the crowds which gather daily to watch the machines are becoming more and more educated in flying matters. Newcomers, however, are still anxious to learn, and the old lady who asked what the block of wood in front of the engine was use for was quite interested on being told it was the propeller used for keeping the engine cool.

The Avro Company hope to have their new four-seater 200 h.p. machines ready for Whitsuntide, when daily services to Manchester, Lancaster and Llandudno should be in full swing.

At Hounslow.

Over 600 passengers were taken up during the week at Hounslow. A new machine has been in use, an Avro Limousine, and this made a trip to Margate and back on May 28th. There was also a trip to Eastbourne and back. Twenty-five trips were given for the Theatrical Garden Party, and these were auctioned in Mr. André Charlot's Monte Carlo.

Aerial Postal Services.

The Post and Telegraph Committee of the London Chamber of Commerce, convinced that aerial postal services will be of great value to the commercial community, have passed a resolution declaring themselves strongly of opinion that the Postmaster-General should immediately make arrangements whereby private organisers who propose to institute aerial services may be enabled to carry and specially deliver letters on payment of the current postal rates and the necessary surcharge.

Stonehenge to Hendon.

On Saturday an Airco 16 machine flew to Stonehenge and collected Brig.-General Heane (1st Australian Division), Lieut.-Colonel Moorhead, Lieut.-Colonel James, and Lieut.-Colonel McArthur, and brought them up to Hendon in 55 minutes to witness the flying display given in honour of Mr. Hawker. They returned to dinner at Stonehenge in the evening by air, taking approximately the same time as before.

On Sunday four more Australian officers (including Colonel Knox and Colonel Beardsmore) were taken to Hendon in under one hour from Stonehenge, and conveyed safely back again.

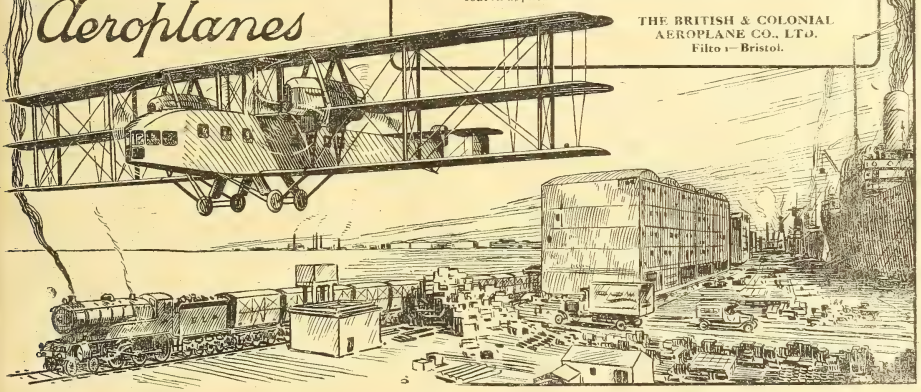
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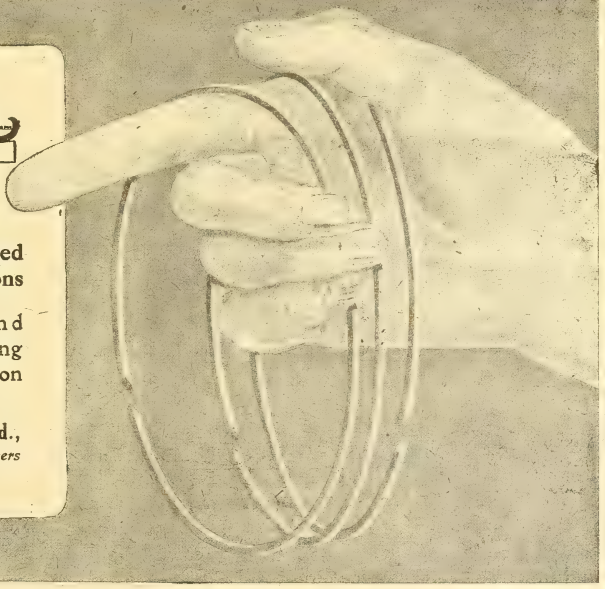
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READING



General Brancker at Cheltenham.

On Saturday, May 24th, Major-General Sir Sefton Brancker, K.C.B., piloted by Capt. W. G. Gathergood, flew from Hendon to Salisbury in a three-seater Airco 9 machine. Stopping the night at Salisbury, he flew on to Cheltenham on Sunday morning to inspect a suitable aerodrome in that vicinity, and after making a thorough investigation from the air of the aerodrome and surroundings landed at Rendcomb.

The return journey to Hendon was made from Rendcomb at 6 o'clock, and Hendon was reached in 40 minutes.

Italy.

According to a message, dated May 29th, the Italian Government has informed the Greek Government that it will give effect to the Convention recently signed between the two countries for an aerial mail service. Two aerodromes are to be established, the one at Corfu, the other at Brindisi.

Brazil.

Handley Page, Ltd., have announced that a Brazilian-Argentine aerial mail service will start on July 1st. Preparations are being made and landing sites have been bought along the Atlantic from Pernambuco to Buenos Aires.

THE PETTICOAT LANE OF AIRCRAFT.

On June 2nd, at the No. 1 Aircraft Salvage Depot, The Hyde, Hendon, was held the first of a series of auction sales of aircraft and aircraft materials, etc., consisting of six Avros, two Armstrong-Whitworth F.K.8s., two B.E.2es., and six D.H.6s., all alleged to be in flying condition and ready to "drive away," together with a large amount of woodwork, mainly struts, skids, propeller cases, etc., canvas, copper, brass, and other metal oil and petrol tanks, rope, scrap timber, wings, etc.

Perhaps owing to the short notice given of the sale, there were not very many buyers, but among that number were a few of that class of person which one always finds on occasions when it is possible to get something for nothing, or as near as may be, and judging from the prices given for articles one could see that the Disposal Board would not lose much by giving the stuff away.

Lots 1—129 consisted mostly of lots of anything from 100—700 ash or spruce struts or skids, and these were principally snapped up by people who, judging from their appearance, were far from being connected with the aircraft business. In fact, one can almost foresee an influx on the market, principally in the East End, of large quantities of genuine antiques, complete with wormholes and cobwebs, which, if one could trace their history sufficiently far back, would be found to consist of genuine ash and spruce taken from a perfectly good Maurice Farman "Shorthorns."

Again, if any furniture dealer could forsake the artistic for the original he might give the pedigree of his wares, whereby any hardened air-fighter would be able to purchase a back-rest or a foot-stool fashioned from the "Rumpety" on which he made his first solo.

Any enterprising farmer who desires to be up to date could, by finding out the direction of the prevailing winds over his land, erect an excellent streamline fence composed of "Avro" struts. Also, if one expected a shortage of fuel for the coming winter, a bundle of 950 solid spruce struts, 6o in. by 4½ in by 1¼ in. would make up into excellent bundles of firewood. In fact, the scope for originality and usefulness is unlimited.

After the auctioneer had disposed of the first 30 or 40 lots, the interest in struts palled, so that by special request lots 274 to 288 were disposed of. This aroused the most interest of the afternoon and also caused the biggest surprise.

The first machine, a 110-h.p. Le Rhône "Avro" fetched the huge sum of £360, which incidentally was the biggest bid of the afternoon. The other five Avros fetched anything from £360—£300.

The two Ack-Ws. both fell to the hammer for £260 each; two B.E.2e's with 90-h.p. R.A.F. engines fetched £90 and £80 respectively, and the remaining six machines, all D.H.6s., fitted with either 80 h.p. Renault, 90-h.p. R.A.F. 1a and Curtiss O.X.5 engines (the latter engine, incidentally, being acclaimed by the auctioneer as the finest American aero-engine ever used in this country barring the Liberty), going for anything from £100 to the beggarly sum of £60. The latter sum was the price given for a D.H.6 arranged as a single-seater and fitted with the aforementioned famous Curtiss engine.

As this sale was the first of its kind, and only arranged more or less as an experiment, one could not form a reliable opinion as to how the second-hand market for aircraft is likely to develop, but a more ambitious sale is to be held on the 23rd of this month, and one ought certainly to expect quicker and keener bidding and highest prices.

Certainly the fact that one can pick up a serviceable aeroplane for an odd £100 or so, ought to have an effect on certain demobilised R.A.F. sportsmen who have been and still are awaiting delivery for cars at twice their pre-war price.—L. L. B.

THE HOUNSLOW AERODROME.

In future the aerodrome at Hounslow will be reserved entirely for civilian flying, and R.A.F. machines will land there only in cases of emergency.

R.A.F. machines using any aerodrome not owned by the Government will, for the present, pay the ordinary civilian fees.

A RESIGNATION.

Mr. R. L. Desoutter, who is well known as one of the most successful test pilots, both of land machines and seaplanes during the war, notifies the fact that he has resigned the position of manager at the works of the British Caudron Company, Ltd., at Alloa, as from May 24th, and that he is now free to consider any proposition from firms who are interested in aeronautical ventures.

His long and varied experience as a test pilot should make him of very great value to firms engaged on experimental work, and his proved business capacity fits him for some position very much more responsible than that of test pilot alone.

Letters addressed to Mr. Desoutter at this office will be forwarded to him promptly.

A RETURN TO BUSINESS.

One learns that Lieut. Ernest Allingham, R.A.F., has quite recently returned from Cologne, and that he is to be demobilised in a few days. Mr. Allingham is a partner in the old-established and well-known firm of advertising consultants and service agents, J. C. Francis and Co., of 131, Fleet Street.

He has been in the R.A.F. for three years, and had eight months' experience of war-flying, during which time he spent 250 hours over the enemy lines as pilot of a Bristol Fighter. He was shot down a few days before the signing of the armistice, but fortunately managed to land inside our lines without serious mishap. Back to his old business once more, he is taking control of the Aviation, Motoring and Engineering Departments, and his added experience and knowledge should prove of very great value to both his firm and their clients.

Mr. Allingham is as full of enthusiasm regarding aviation as he is about advertising, and he intends to use his aeroplane to pay flying visits to his many clients in various parts of the Kingdom. It is interesting also to know that this firm (J. C. Francis and Co.) are in a position to take orders for the transport of passengers by aeroplane either for business or pleasure, and they welcome inquiries on the subject from any firm or individual who is interested.

J. C. Francis and Co.'s new watchword is—"We go anywhere for business—by aeroplane."

A FINE ADVERTISEMENT.

The Aircraft Manufacturing Co., Ltd., are producing a series of picture post-cards of various modern Airco machines, such as the D.H.9, and 10, the Limousine and the Liberty 4. These post-cards are genuine photographs and not merely prints, and are beautifully produced. It is the intention of the Aircraft Co. to supply these at 1s. per set of six to anyone applying to the firm at Edgware Road, The Hyde, Hendon, and it is hoped that large supplies for this purpose available for the public will be ready very soon.

It strikes one that this generosity is going to cost the Aircraft Co. a lot of money, for one has never yet seen photograph post-cards of such quality or of greater interest sold so cheaply, and one advises those who desire to have copies to apply for them at once.

A VISIT TO THE NORTH BRITISH RUBBER COMPANY.

On May 22nd, the Lord High Commissioner for Scotland, the Duke of Atholl, the President of the Royal Aero Club, who is at present in Scotland in connection with his duties as High Commissioner, paid a visit to the works of the North British Rubber Company at Castle Mills. This firm was a pioneer rubber-proof balloon fabric, and has been long connected with the Aircraft Industry. The Cadets and Girl Guides of the works formed a Guard of Honour which the Duke of Atholl inspected before entering the works. Mr. Alexander Johnston received His Grace.

AN EXPENSIVE AMUSEMENT.

At Bow Street Police Court on May 31st, before Mr. Garrett, Robert Andrew Scott, 21, and Harry George Stone, 18, both of the H.A., were charged with stealing and receiving a Crossley motor-car, valued at £800, the property of the Air Ministry.

Scott told the magistrate that he and the other defendant noticed the car unattended in the Strand, and thought they would go for a ride. He was arrested as an absentee on the day he sold the car.

Lieut. Horace Whitley, R.A.F., stated that some of the accessories were missing and two of the figures on the identification plate had been painted out.

In reply to the magistrate, the witness said that anyone with mechanical knowledge could see that the number had been altered.

The defendants were committed for trial.

THE OLD STORY.

Capt. H. J. Saint, No. 1 pilot, of the Aircraft Manufacturing Co., collided with a hill near Portsmouth at 5 a.m. on May 1st, while flying a D.H.9 at 90 m.p.h., with copies of the "Daily Mail" from Hendon to Bournemouth.

Capt. Saint fractured his jaw and his machine was completely wrecked, but as he was wearing Triplex Safety Glass goggles his eyesight was saved.

AIRCRAFT FINANCE

PARTICIPATING POLICIES FOR AVIATION INSURANCE.

It has been decided to inaugurate a scheme of participating policies in respect of aircraft insurance. Those who have been disposed to complain about the premiums quoted for aviation risks should derive some satisfaction from this important decision of the Aviation Insurance Association. Participating policies, it need scarcely be said, are quite common features of ordinary life assurance business, and are greatly appreciated by many people.

A Challenge to Critics.

Let it be clearly understood that this present innovation covers accidental damage to aircraft only. Quite frankly it is admitted that it has been instituted to meet the requirements of those owners of aircraft to whom the rates charged for accidental damage may seem at the present time excessive. As there are people who cannot be convinced that the present scale of premiums is reasonable, the idea of the Association is to remove the objection by issuing a participating policy whereby the excess profit, if any, will be returned to the insured.

Pooling the Premiums.

By this scheme the insured will participate in 50 per cent. of the profit derived from aircraft damage insurance business. The whole of the premium derived from participating aircraft business will be pooled, and the insured will, as soon as the underwriting accounts for the year have been closed, participate in the specified proportion of the profits according to the amount of premiums paid.

A Corrective.

In no case, it is pointed out, will the amount payable under the scheme be more than 75 per cent. of the actual profit on the policy in question, and where a policy has made a loss to the underwriters there will naturally be no return made. It is argued that in this way an efficacious corrective will be automatically applied, should experience substantiate the contention that the present level of rates is excessive. Owners of aircraft doubtless will feel that they have scored in such circumstances, and the underwriters will be equally satisfied in view of their assertion that their policy is to provide reasonable insurance facilities to the aeronautical trade at a reasonable scale of remuneration.

A Rock Bottom Basis.

Without a doubt there are critics who will attempt to prove the faults of the new scheme. It is not faultless. Is there anything on earth that is faultless? One must admit, however, that it is a serious attempt to bring the youthful business of aviation insurance down to a rock-bottom basis. As yet it is not sufficiently old to have proved its limitations and its capabilities, but the participating innovation should accelerate the movement towards that goal.

"Loaded" Premiums.

It will be suggested, one may be quite certain, that the participation scheme is so simple as to create suspicion. What would prevent the underwriters from "loading" the premium on participating policies and thus recouping themselves for the privilege offered to the insured at the initial expense of the insured? But the underwriters frankly and openly assert that they have no intention of "loading" the premiums purposely to cover the additional accommodation.

Results Would Tell the Tale.

Anyway, at the end of the year when the pooling of profits or losses is made, an excessive premium would be at once proved by the scale of profits made. The insured would in such circumstances receive a big sum. In that event the proof of excessive premiums would be established, and the aeronautical trade would be justified in demanding that a more reasonable scale of premiums be established without delay.

Stipulations Explained.

What else could be proposed in order to carry conviction? One suspects the stipulation that the clause "in no case will the amount payable under this scheme be more than 75 per cent. of the actual profit on the policy in question" will provoke discussion, but it is obvious that, when the whole of the results are pooled and the distribution of the profit is made in proportion to the individual totals of the policies outstanding, the question of working expenses must be taken into consideration as well. Where a policy made a loss to the underwriters, no one expects anything to be returned.

Furthermore, the accounts being made up only when the risks of the underwriting year have been closed, no provision is necessary for unexpired risk or for outstanding claims, and the amount of profit can be calculated, therefore, on a very simple basis. This simplicity is an advantage.

Helpful for Efficiency.

It is almost superfluous to point out that the participating policy is calculated to put a premium on efficiency, and to inspire a more reasonable degree of caution in the methods of the owners of aircraft.

Wm. J. Davies.

CURRENT TOPICS.

Whiteheads Want More Capital.

Just at present the Financial World is in the doldrums, and until the big Funding Loan is out of the way there is an idea that conditions will remain slack. It would not be surprising, however, if occasional spasms of buoyancy developed. By the way, the directors of Whitehead Aircraft (1917), Ltd., are appealing to shareholders to provide £50,000 in the form of 10 per cent. Notes repayable at par on or before June 1st next year. These are offered at 98, and in view of the position, discussed last week, one fears that the appeal will be in vain. The intention is to enter the motor-car business. The development is interesting but calls for no comment.

Surveying Air Routes.

It transpires that a new venture, entitled the Aircraft Communication and Meteorological Survey Co., Ltd., has been formed for the purpose of making surveys for air routes and to negotiate and obtain contracts for building them. The initial capital is £2,000. The idea is novel and one need not say anything more about it.

Napiers and the Government Policy.

Some pertinent and interesting remarks concerning the official policy in regard to aviation were made at the shareholders' meeting of D. Napier and Son:—

As stated in the report, important progress in the development and manufacture of aero-engines has been made by the company during the past year, but I regret to say that while apparently foreign countries recognise the advisability of fostering such business, aero engine manufacturers in this country are not receiving encouragement from the British Government to continue

the manufacture of such engines. At the present time, so far as your company is concerned, we expect to shortly complete our present contracts for Napier aero engines for the Government. You are aware that your company was the first to originally produce the six-cylinder engine car successfully, and our aim now is to produce a model which will far surpass anything of its kind made heretofore. However, the aero-engine has taken many years of experience and skill to bring it into successful production, and having gone through that stage we are desirous of retaining that practical knowledge for the benefit of future aviation, and we venture to hope that the Government will yet see that it would be false economy to allow this experience to be practically abandoned instead of spending a reasonable sum to maintain British supremacy in the air. There is no doubt that commercial aviation will come in time, but it is the period between now and then in which manufacturers of aero engines and aircraft should receive every encouragement from the Government to keep their experienced and skilled people actively employed in the manufacture and development of this class of work if we, as a nation, are to be prepared to hold our own in the air in the future."

NAVARRO-WELLESLEY AVIATION DEAL.

Quite recently—it was in April to be precise—the Wellesley-Brown Aircraft Co. appealed to the investing public to subscribe for capital. It now transpires that freehold premises at Kingston-on-Thames have been acquired. Adjoining buildings and land also purchased will permit, it is claimed, of future extensions. The benefit of existing Admiralty contracts of the London and Kingston Boat and Motor Co. are included in the purchase.

The entire undertaking of the Navarro Aviation Co., of Burton-on-Trent, has been purchased as well, the consideration being £20,000, of which £10,000 is to be in fully paid shares, with the stipulation that if £40,000 cash is raised in respect of additional capital before Oct. 31st next, the balance of £10,000 to the Navarro Co. will be paid in cash, failing that, 25 per cent. of the net subscription as reserve and the residue in fully paid Wellesley shares The name is to be changed to Navarro-Wellesley Aviation, Ltd.

ROVER CAPITAL TO BE INCREASED.

Rover shares have been active of late, and it now transpires that the capital is to be increased to £500,000, and that shareholders will be offered 150,000 new shares pro rata at a premium yet to be decided.

NEW COMPANIES.

SHORT BROTHERS (ROCHESTER AND BEDFORD), LTD.—Private company. Registered May 28th. Capital, £150,000 in £1 shares. To take over the business of aeronautical engineers carried on by Short Brothers, at Rochester, at Cardington, Beds., at Battersea, S.W., and at 29-30 Charing Cross, S.W., and with a view thereto to enter into two agreements with A. E. and H. O. Short. The subscribers (each with one share) are:—H. O Short, Norfolk Lodge, Borstal Road, Rochester, aeronautical engineer; A. I. M. Duncan, 21, Leadenhall Street, E.C., solicitor. First directors: H. O. Short, A. I. M. Duncan, and E. B. Parker. Registered office: 29-30, Charing Cross, S.W.

AUTOMOBILE AND AIRCRAFT INSURANCE CO., LTD.—Registered May 26th. Capital, £100,000 in £1 shares. To carry on vehicle, motor, cycle, aircraft, glass, boiler, engine, electric plant and general insurance (but *not* life, fire, accident, or employers' liability insurance or bond investment business within the meaning of Section 1 of the Assurance Companies Act, 1909). The promoters are the General Accident, Fire and Life Assurance Corporation, Ltd. No promotion money is payable and no material contracts have been entered into. The preliminary expenses are estimated at £500. Minimum cash subscription 5,000 shares. The first directors are:—Rt. Hon. Lord Morris, P.C., K.C.M.G.; F Norrie-Miller, J.P., F.E.I.S., Cleeve, Perth, N.B.; Sir John Taverner, K.C.M.G., Bexley; Col. S. Wishart, Wilbury Lawn, Brighton; J R. Yates, Boscobel, Oakhill Avenue, Hampstead, and P. F. Brittain, South Cliff Avenue, Eastbourne. The first named are directors of the promoting company. Qualification £250. Registered office: General Buildings, Aldwych, W.C.1.

CUBITTS ENGINEERING CO., LTD.—Registered May 27th. Capital £600,000 in £1 shares (250,000 7½ per cent. cum. pref.). To enter into two agreements with Holland and Hannen and Cubitts, Ltd., and to carry on the business of manufacturers of, wholesale and retail dealers in, letters to hire and importers and exporters of motor vehicles, ships, boats, airships, flying machines and the wheels, tyres, engines, bodies, parts, and components thereof and accessories thereto, rubber and rubber goods manufacturers, etc. Minimum cash subscription 7 shares. The first directors are:—E. C. Hannen, 7, Park Lane, W., director of Holland and Hannen and Cubitts, Ltd.; G. R. Holland, Langley House, Kings Langley, Herts, director of Holland and Hannen and Cubitts, Ltd.; E. M. May, Harperbury, Radlett, Herts, director of Holland and Hannen and Cubitts, Ltd.; H. J. Joseph, Woolley Hall, Maidenhead, financial manager to Holland and Hannen and Cubitts, Ltd.; J. Putnam, Hayden Hill House, Aylesbury, director to Gunter and Co., Ltd., and R. G. Paget and Sons, Ltd.; P. L. H Dodson, 21, Ravenscourt Park, W.6. Qualification, £1,000. Remuneration £150 each per annum, increasing to £300 according to dividends. Solicitors: Grundy, Kershaw and Co., 6, Austin Friars, E.C.

AEROFILMS, LTD.—Private company. Registered May 9th. Capital, £3,000 in £1 shares. Supplying cinematograph films of aerial incidents. The subscribers (each with one share) are:—G. Reader, 35, Coleman Street, E.C., solicitor; W. A. Chadwick, 35, Coleman Street, E.C., solicitor. Directors: C. Grahame-White, F. L. Wills, and H. W. Matthews. Solicitors: G. Reader and Co., 35, Coleman Street, E.C.2.

FAIREY AND CHARLES, LTD.—Private company. Registered May 14th. Capital £50,000 in £1 shares. Manufacturers and dealers in motor-cars, carriages, cabs, omnibuses, vans, cycles, ships, launches, boats, aeroplanes, water-planes, flying boats, and other public and private conveyances, whether propelled by petrol, steam, electricity, or other power, etc. The subscribers (each with one share) are:—E. A. Fairey, Grove Cottage, Iver, Bucks, engineer; F. M. Charles, Brackenwood, Iver Heath, Bucks, engineer. Managing directors:—C. R. Fairey and F. M. Charles. Solicitors:—Ashurst, Morris, Crisp and Co., 17, Throgmorton Avenue, E.C.2.

W. H. HARRISON (BURNLEY), LTD.—Private company. Registered May 12th. Capital £20,000 in £1 shares. Aeronautical, automobile, marine and general engineers. The subscribers (each with one share) are:—W. H. Harrison, 110, Melville Street, Burnley, motor engineer; Roland Taylor, 51, Kay Street, Rawtenstall, master porter; J. C Parkinson, 47, Burnley Road, Rawtenstall, motor engineer. Directors: W. H. Harrison, R. Taylor and J. C. Parkinson. Solicitors: J. C. Waddington, Imperial Chambers, Grimshaw Street, Burnley.

A. E. Co., LTD. Private company. Registered May 9th. Capital £1,000 in £1 shares. Aircraft, mechanical, electrical, marine, motor and general engineers, etc. First directors: H. J. Heasman, 60, Grove Road, E.17, engineer; J. J. Clifford, 49, Cleveland Park Avenue, E.17, engineer; J. E. Clark, 10, Redbourn Avenue, N.3, C.A. Registered office: 59, Chancery Lane, W.C.

ANGLO-BELGIAN AVIATION AND MECHANICAL CO., LTD.—Private company. Registered May 9th. Capital £15,000 in £1 shares. To carry on business as indicated by the title. The subscribers are: T. D Jones, Albermans House, Bishopsgate, E.C., general merchant; H. M. Carter, Alderman's House, Bishopsgate, E.C., general merchant. First directors to be appointed by the subscribers. Solicitor: H. S. Holt, 6, Gray's Inn Square, W.C.2.

PYROTECHNICS, LTD.—Private company. Registered May 14th. Capital £10,000 in £1 shares. Manufacturers of and dealers in fireworks, illuminants, marine, aerial and other signals, flares and coloured lights, sporting and blasting powders, etc. The subscribers are:—Major C. Etchells, D.S.O., M.C., 39, Tavistock Square, W.C.1, 500 shares; G. J. Jones, Aldine House, Belvedere, Kent, research chemist, 300 shares; C. R. Harler, 19, Mulgrave Place, Woolwich, S.E.18, research chemist, 300 shares. First directors: Major C. Etchells, D.S.O., M.C., signs as managing director, G. J. Jones and C. R. Harler.

FLYING BOAT CO., LTD.—Private company. Registered May 14th. Capital £50,000 in £1 shares. Manufacturers of and dealers in flying boats, seaplanes and aircraft generally, etc. The subscribers (each with one share) are: J. F. Seacombe and H. J. Gay, both clerks, of 8, Finch Lane, E.C.3. First directors to be appointed by the subscribers. Solicitors: Simmons and Simmons, 18, Finch Lane, E.C.

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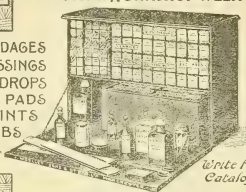
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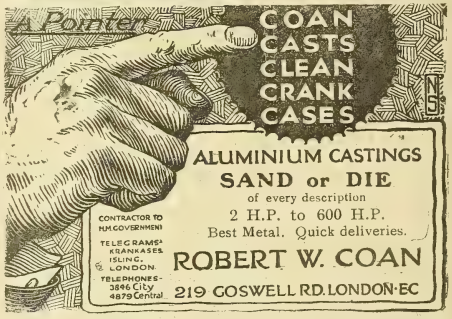
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AIRCRAFT IN PARLIAMENT

THE HOUSE OF LORDS.

THE CASE OF MISS PENNANT

On May 29th, Earl STANHOPE moved:—"That in view of the allegations made both in public and privately against Miss Violet Douglas-Pennant, this House is of opinion that a judicial inquiry should be held forthwith to examine the circumstances leading to her dismissal from the Royal Air Force." He said that the summary dismissal of Miss Pennant had created considerable interest throughout the country and had been the subject of debates in both Houses of Parliament. Miss Pennant was known to many of their lordships and was widely known throughout the country. She had 10 years' public service to her credit, nearly seven of which had been spent as an Insurance Commissioner for Wales. Yet this lady had been summarily dismissed from the Royal Air Force, and he could not understand why the Government should object to an inquiry.

When, on August 2th, Major-Gen. Brancker informed Miss Pennant that she was dismissed he said it was not because she was inefficient, but "because you are so unpopular with all who come in contact with you that nothing can be done with you while you are there." It was a new policy in this country for public servants to be dismissed because they were unpopular. He denied, however, that Miss Pennant was unpopular. She had been flooded with letters from persons who had worked under her and with her who said that they had much enjoyed working with her.

It was hardly surprising, in view of the way in which Miss Pennant was treated, that remarks were beginning to spread making attacks against her private life. Only yesterday a rumour reached him to that effect in the City, and Mr. Tyson Wilson, who was the Whip of the Labour Party, had said to several witnesses that charges had been made against Miss Pennant of so serious a character that, if they were published, she would never hold up her head again, that her public career was not all as good as it was painted, and Mr. Wilson recommended those who were talking to him to have nothing to do with it, or they also would suffer. It was true that Mr. Tyson Wilson had denied that statement, but it was made in the presence of witnesses.

Mr. Cecil Harmsworth had written Miss Pennant a letter in which he used these words:—"I have strongly recommended that a Judicial inquiry should be held." And he wrote again just before the General Election, "Very sorry called away to constituency before all the arrangements for your inquiry completed," and he went so far as to ask what reparation would satisfy her for the way she had been treated. Proceeding, the noble lord said Miss Pennant's case had been submitted to a committee composed of both Houses of Parliament, and they unanimously came to the conclusion that she had made out a *prima facie* case which justified an inquiry to be held. A grave injustice had been inflicted on Miss Pennant and an inquiry should be granted.

Lord BERESFORD supported the motion for an inquiry. He agreed that it would be fatal if that House or any other House tried to assert that the authorities had not the right to discharge and appoint. His own case was very similar. He did not agree with the Admiralty at all when he was Commander-in-Chief, and told them so. They did not understand about the war, and they hauled down his flag and put him on the beach. (Laughter.) The fact that he was right and they were wrong had nothing to do with the case, because the authorities must have the right to appoint and discharge officials.

In his case he had an inquiry and got it, and after sitting three days a week for four months, that inquiry proved that he was correct. That inquiry did a great deal of good; and he got a great many things altered. Under the circumstances he supported the motion. There had been too much secrecy about this matter. (Hear, hear.)

Lord CLWYD said that the public services Miss Pennant had performed in Wales and elsewhere and her character, the Government should be pressed to hold an inquiry.

The MARQUESS of LONDONDERRY, in reply, thought the controversy was based on an imperfect knowledge of the case. He repudiated every one of the accusations made in regard to concealment, deception, and corruption in this case. There was no one whose character for any sort of concealment. The bare outline of the case was that this lady undertook a very difficult task and encountered immense difficulties, and as time went on it was decided to make a change. Many people who had been transferred or dismissed were labouring under a grievance, but was it suggested that they should all have a Judicial inquiry?

Lord BERESFORD: I suggest that they should if they demand it.

The MARQUESS of LONDONDERRY: That would mean a multitude of inquiries. Continuing, his lordship said that Lord Weir did not attempt to escape censure for the manner in which Miss Pennant was superseded. He (Lord Londonderry) admitted that Miss Pennant was not treated with the consideration to which she was entitled, but while that was a ground of grievance, it could not be said that it was a ground for inquiry. He had read all the correspondence and he had seen everybody whom he could see connected with the case, and he could not find any ground for the inquiry demanded.

With regard to Mr. Cecil Harmsworth's report, Mr. Harmsworth was at the time the Prime Minister's Private Secretary. His report was a private and confidential one, and it recommended that there should be a Judicial inquiry. But the Prime Minister, after reading what Lord Weir said, decided that it was not right or necessary to press the inquiry.

Mr. Harmsworth went down in a practically unofficial capacity and he interviewed a number of persons and obtained their opinions. These persons had not the slightest idea that what they told Mr. Harmsworth would be the subject for a White Paper to be laid on the table of both Houses of Parliament, and he (Lord Londonderry) felt that they would make it impossible for inquiries of this kind to be made if there was any possibility of the report being made public.

The Government were convinced that an inquiry of the kind suggested would be contrary to the interests of the public service. Miss Douglas-Pennant had stated that she had to contend with immense difficulties, and that there was a conspiracy to frustrate her efforts, and that small knots of people inside the Admiralty were in league to frustrate her work at the Air Ministry.

The Secretary of State satisfied himself that Miss Pennant—although he was quite aware of her other qualities—had not the qualities which were necessary to overcome those difficulties, and he had no alternative but to appoint someone else in her place. The proof that he took the right course was to be found in the fact that affairs began to mend from that moment, and he thought they could claim that the W.R.A.F. was now in an efficient condition.

He hoped the House would see that there was no case for a Judicial inquiry into the dismissal of a public servant who could not claim that efficiency in the department in which she was placed, and which had subsequently been managed in a satisfactory manner.

Lord BUCKMASTER said that the most cursory examination of the White Paper containing the correspondence would convince unprejudiced people that there was a serious matter in issue between Miss Pennant and the Air Ministry which could not be satisfied merely by an official answer, however candidly it might be given.

The EARL of DONOUGHMORE said in view of the charges contained in the papers circulated amongst their lordships, he was going to vote for an inquiry. He wished it to be understood that in voting for the motion he was only voting for an inquiry. He was not at all sure that Miss Pennant would get all the benefit from the inquiry that she expected.

THE HOUSE OF COMMONS.

The following oral answers were given on May 26th:—

ROYAL AIR FORCE.—LEAVE FOR INDIAN DRAFTS.

Sir HERBERT NIELD asked the Under Secretary of State to the Air Ministry whether he was aware that Leading Air-Mechanic Daniel Mahoney, No. 62750, late 49th Squadron, Royal Air Force, who had served twenty months in France, was ordered to leave Belgium for India at two hours' notice, which did not allow him time to send his personal belongings home; why it was that this soldier was not granted leave; whether he will see that steps are taken in the future to ensure that soldiers have an opportunity of seeing their relatives before being dispatched to India and like places at a great distance from home; and whether he will give facilities for Mahoney to return at an early date and, in the meantime, see that steps are taken to prevent the practice complained of being continued.

General SEELY: This airman is serving on an ordinary long-service engagement with the Colours. The departure of the Squadron to which he was posted was too near at hand to make it possible to grant him home leave. Home leave is given before men are sent to distant stations providing the exigencies of the Service permit, and it is regretted that the urgency of the departure of this Squadron to India made it impossible to follow this general rule on this occasion.

TIMBER COMMITTEE.

Mr. REMER asked the Under Secretary of State to the Air Ministry whether he was aware that one of the co-opted members of his Timber Committee was the official responsible for sanctioning the use of cypress on aeroplanes; whether he was aware that not more than two members of the Committee have any practical experience of sawing or converting timber; whether he will state the date that this Committee was appointed; and whether he will invite the National Federation of Sawmill Proprietors to nominate additional representatives to assist him in this important work.

General SEELY: I cannot accept the suggestion contained in the first part of the question. The decision was one arrived at by the responsible Technical Department on consideration of all the factors involved, one of which was the prospect of a future failure of supplies of better tried types of wood. The Timber Sub-Committee of the Conjoint Board was appointed on October 10th, 1917. Its composition is, I think, adequately representative for its purposes, but I will communicate the suggestion in the last paragraph of my hon. friend's question to the Conjoint Board.

AIR NAVIGATION.—CONVENTION APPROVED.

Mr. G. MURRAY (*by Private Notice*) asked the Under Secretary of State for Air whether the Convention relating to Air Navigation has yet been agreed to by the Allied and Associated Powers, and, if so, whether he will lay the document upon the Table of the House.

General SEELY: Yes, Sir; I am glad to be able to tell the House that on Thursday last, in Paris, the Aeronautical Commission held its final meeting, and agreed to a Convention relating to Air Navigation. On this Commission the five principal Powers are represented, as also Belgium, Brazil, Cuba, Greece, Portugal, Roumania and Serbia. The seven smaller Powers enumerated have been appointed by the Supreme Council to represent on the Aeronautical Commission all the smaller Powers at the Peace Conference.

The Commission will agree upon a covering Report to be submitted to the Supreme Council. A few reservations by the Delegates of some of these States will be included in this Report. I do not expect that those reservations will affect the usefulness of the Convention. The document is of fifty-six pages, embodying general principles, nationality of aircraft, certificates of air-worthiness and competency, and many other matters of great importance to air navigation. It is of great interest, and I hope to lay it on the Table on an early day.

* * *

The following oral answers were given on May 27th:—

ROYAL AIR FORCE.—MOTOR CARS.

Lieut.-Col. W. GUINNESS asked the Under Secretary of State to the Air Ministry how many motor-cars are allotted to the civilian officials of the Air Ministry.

The UNDER SECRETARY of STATE for AIR (Major-Gen. Séely): Six.

Lieut.-Col. GUINNESS: Do the Regulations allow these cars to convey officials to and from their residencies or do they come by 'bus?

Major-Gen. SEELY: I think they are permitted to convey the officials from their residences. I hasten to say that I think it very reasonable that they should.

Lieut.-Col. GUINNESS: Is the right hon. gentleman aware that the Leader of the House said yesterday that Regulations were issued limiting cars strictly to official business?

Major-Gen SEELY: Yes, and I regard it as official business for these Civil officials to go to their residences or come from them to their offices. If a different policy is laid down, we shall conform to it, but I say at once on behalf of those to whom the cars are allotted, that I think it would be a mistaken policy to force these people, who are giving their services to the State, very often free, to go to the expense of hiring cars.

Mr. HOGGE: Is the right hon. gentleman aware that every Member of this House gives a large amount of time and money to the State and comes to the House and goes from it at his own expense? Does he really ask the House seriously to believe that people employed at the Air Ministry have a right to use public cars at the public expense to take them to and from their residences to their work?

Major-Gen. SEELY: I am not speaking of myself, naturally enough—my present office costs me a great deal of money—but I am speaking for the other officials, and under present circumstances where the difficulty is to find time enough to get the work done where millions of money are involved the officials to whom I refer, who cannot find the time to get the work done as that is, it would be a reactionary step to force them to hire cars for themselves. It is difficult enough to get the work done as it is.

Sir F. FLANNERY: Is my right hon. friend aware that the Magasin de Louvre and other large business concerns have established a system

of conveying their employees from their residences in the morning, and that they do that as a matter of business economy in order to save the time of the employees?

AIR MINISTRY (ACCOMMODATION)

Major BOYD-CARPENTER asked the Under Secretary to the Air Ministry what was the present amount paid for No. 4 Thurloe Place; what is the amount of ground rent for these premises; with whom the rent had been arranged; and who was the owner at the time of the arrangement.

Major-Gen. SEELY: The rate of compensation paid for the occupation of 4, Thurloe Place, is £2,530 per annum. The ground rent is £2,295. The rate of compensation was settled by the Defence of the Realm Losses Commission, the legal owner at the time of the arrangement being a Controller appointed by the Board of Trade to wind up the business of the Continental Tyre Company, Limited.

Major BOYD-CARPENTER asked what was the number of officers comprising the staff known as the South-Eastern area; what necessity there was in accommodating them in such premises as No. 4, Thurloe Place; whether they could not be accommodated at Kenley or Hounslow in huts, thus saving public money; and whether any attempt was made to so accommodate them.

Major-Gen. SEELY: The present number of officers engaged at Thurloe Place is eighty-one, the number of other ranks and of clerical staff being 288. The possibility of these headquarters being located out of London was fully considered, but it was decided that the administrative disadvantages which would follow were too great to allow that course being adopted. A large amount of public money had been saved by the move from Covent Garden Hotel, etc., to Thurloe Place.

Major LANE-FOX: Why is it necessary that the Air Force should take larger premises than they occupied before?

Major-Gen. SEELY: I am advised that that is not the case. There are fewer persons employed, and the total premises now occupied are smaller than those occupied before.

Major LANE-FOX: Is the right hon. gentleman aware that in answer to a question which I asked, I was told that the premises—the number of square feet—were considerably larger than the other premises?

Major-Gen. SEELY: I think not. They would be larger than the Covent Garden Hotel, but there were other places occupied by the same organisation now at Thurloe Place.

Sir H. DALZIEL: Can the right hon. gentleman say how many rooms were occupied at the Covent Garden Hotel?

Major-Gen. SEELY: It was before my time, but I will find out.

Sir H. DALZIEL: About a dozen.

Major BOYD-CARPENTER asked the Under Secretary to the Air Ministry if he was aware that when the tender for the purchase of 4, Thurloe Place was submitted it contained a specific statement as to the requirements for which it was being purchased and that, under Government authority, the tender was accepted without any objection as to these requirements.

Mr BRIDGEMAN: I have been asked to reply. I am informed that when the tender for the purchase of Nos. 1 to 4, Thurloe Place was submitted, a statement was made that the property might possibly be utilised for the purpose of letting flats. As the conditions under which the premises were then occupied were known to the would-be purchaser, the tender was accepted without any objection as to these requirements.

Sir R. COOPER: Is it not very unjust for the Government to allow a sale like this to go through, knowing the precise conditions under which it was being purchased, and then when it was completed to turn round and take the premises out of the hands of the purchaser?

Mr. BRIDGEMAN: The purchaser knew the conditions?

Sir R. COOPER: So did the Government.

Major LANE-FOX: Is it not a fact that the owner of the premises stated that before the premises were taken for this purpose notification would be sent, and that no notification was sent?

Mr. BRIDGEMAN: I cannot answer that offhand. I will try to find out, if the hon. gentleman will tell me who it was that promised to give notification.

Major LANE-FOX: It was an official of the hon. gentleman's Department.

YATE (GLOUCESTERSHIRE) AERODROME.

Mr. RENDALL asked the Under Secretary to the Air Ministry whether he was aware that many girls and women who volunteered for work at the Yate (Glos.) aerodrome have been recently discharged and their places taken by other women; whether this action is locally regarded as unjust and results in the turned-off women receiving out-of-work donation; whether, as the result of newspaper correspondence, no women received fresh notices on Friday, May 16th, but many girls left that week owing to previous notices and eight or nine fresh ones were taken on; and will he say what justification there is for this conduct.

Major-Gen. SEELY: I have not yet had time to obtain full information on this matter, and should be obliged if my hon. friend would postpone his question till Thursday.

OVERSEA FLIGHTS.

Sir A. FELL asked the Under Secretary to the Air Ministry if he will consider the question of the Government forbidding the flight of aeroplanes over wide stretches of sea until the aeroplanes have proved that they are capable of making non-stop flights over land of equal length with reasonable certainty.

Major-Gen. SEELY: I would refer to my statement in answer to a question on the same lines raised by the hon. and gallant Member for Lanark in the course of the Debate on the Adjournment on the 20th instant.

* * *

The following written answer was given on May 27th:—

ROYAL AIR FORCE.—HALTON CAMP (WAGES).

Capt. BOWYER asked the Parliamentary Secretary to the Ministry of Munitions whether the men working on the contract at Halton Camp, Bucks, are receiving an exhorbitant rate of wages; whether, owing to lack of competent supervision, a minimum of work is being done for these wages; whether he was aware that as a result local labour is being demoralised by the sight of little work and high wages and is being attracted to Halton; and whether he will set up an inquiry into this matter, in view of the fact that local employers find it impossible to compete with the high wages at present ruling.

Major-Gen. SEELY: The rates of wages paid at Halton Camp are in accordance with Award No. 2197 of the Committee of Production, a copy of which I am sending to my hon. and gallant friend. I visited the camp ten days ago, and action has already been taken in order to ensure that there shall be no undue delay in carrying out the work, which urgently requires completion.

The following oral answers were given on May 28th:—

INDIA.—BOMBING BY AEROPLANES.

Colonel WEDGWOOD asked the Secretary of State for India whether aeroplanes were employed to drop bombs on Indian rioters; if so, where, and by whose orders; and whether, in view of the difficulty of hitting any target with such bombs, he will issue directions that such weapons are not to be used in future against civilian populations.

The SECRETARY of STATE for INDIA (Mr. Montagu): Aeroplanes were used at Gujranwala in the Punjab as a measure of military necessity. They were dispatched from Lahore by the military authorities, and one plane dropped a few bombs on a mob which had since early morning been occupied in destroying houses in the civil station, the railway station and church, while women and children had taken refuge in the Treasury, protected only by a small force of police.

Colonel WEDGWOOD: Have instructions been given that aeroplanes are not to be used in future against the civilian population?

Mr. MONTAGU: No, Sir; the responsibility for carrying out martial law must rest with those who have to administer it. And if this is a question of dispersing a mob which is threatening the lives of women and children who are insufficiently guarded I refuse to interfere with the discretion of the military authorities.

Colonel WEDGWOOD: In view of the fact that these aeroplanes cannot drop bombs accurately, and that therefore in large towns bombs are about certain to hit the wrong people, would it not be more humane to employ the other efficient means of defence in our power?

Mr. MONTAGU: Certainly in this case the aeroplane was successful in dispersing the mob. I am not sufficient of an expert to endorse the hon. and gallant gentleman's remarks about aeroplanes, but I would observe that there is all the difference in the world between aeroplanes flying at low altitude and those flying at a high altitude in order to avoid guns.

Colonel WEDGWOOD: How many people were killed?

Hon. MEMBERS: Order, order!

Colonel WEDGWOOD: I am always in order. How many people were killed, and how many of these were non-rioters?

Mr. MONTAGU: I hope eventually to have the information necessary to inform the House about all these occurrences.

ROYAL NAVY.—TRANS-ATLANTIC FLIGHT.

Lieut.-Col. W. GUINNESS asked the First Lord of the Admiralty if he would state what would have been the cost per month of keeping a line of ships stretched at intervals of fifty miles across the Atlantic while awaiting favourable weather for the trans-Atlantic flight.

Dr. MACNAMARA: I really do not think that any good purpose would be served by endeavouring to work out this cost, though, of course, it would be considerable. Neither do I think it is primarily a question of cost at all. The real question is what is the proper function of the Navy, and how far it is desirable and possible to add to its duties by obligations such as those indicated in my hon. and gallant friend's question. On that, as has been said more than once, the present commitments of the Navy are heavy and responsible. They cannot under any circumstances be set aside; and its resources leave no margin whatever for undertaking duties such as those referred to in the question.

Lieut.-Col. GUINNESS: As a matter of expert opinion, would it be possible to keep the Navy strung out in this way for an indefinite period, such as would have been necessary if public clamour had been satisfied?

Dr. MACNAMARA: I have already said it would be very expensive, but as it cannot be done the question of cost does not arise.

Lieut.-Col. GUINNESS: It cannot be done?

Dr. MACNAMARA: No.

Lieut.-Col. Sir J. NORTON GRIFFITHS: Would it be possible, in the event of such flights taking place, if Admiralty ships were in the vicinity of the flight, that they should be notified that the flight is taking place so that they may keep a look out?

Dr. MACNAMARA: If they are there, yes—but they are always on the look out! I will put the point of notification to naval authorities.

Sir J. NORTON GRIFFITHS: Will the vessels be notified?

Dr. MACNAMARA: I will put the suggestion at once to the naval authorities.

Commdr. BELLAIRS: Would it not be quite possible to have fully-manned ships stationed on the West Coast of Ireland instead of two half-manned destroyers stationed at Queenstown?

Dr. MACNAMARA: It is a question of personnel, and the numbers in the Fleet. Many demands have been made for demobilisation as my hon. and gallant friend knows.

Commdr. BELLAIRS: Can you send the ships out?

Dr. MACNAMARA: My hon. and gallant friends request shall be put to the authorities.

* * *

The following oral answer was given on May 29th:—

CASUALTIES.

Mr. CLOUGH asked how many casualties there have been in the Air Force since the Armistice up to the present time, mentioning in addition those which have had a fatal termination.

Major-Gen. SEELY: The reply is as follows:—Officers, fatal, 374 up to May 25th, 1918, for Home and Overseas; other ranks, fatal, 848. The above figures are up to April 30th, as it was not possible to work out the information up to a later date in the time available. The figures for non-fatal casualties up to date are being inquired into.

* * *

The following is from the "Times" of June 3rd:—

Capt. WEDGWOOD BENN asked the Under Secretary for Air whether he could make a statement about the future organisation of the lighter-than-air branch of the Air Service.

Major-Gen. SEELY (Under Secretary for Air): Proposals to transfer the responsibility for airship construction from the Admiralty to the Air Ministry are now under discussion between the two Departments. I think it would be inadvisable to make any further announcement at present, but I will do so as soon as details have been arranged.

Major-Gen. SEELY, in reply to a question by Captain Ormsby-Gore, said that the Tarrant triplane was built for military purposes to the order of the Government, and it would not be in the interest of the public service for the results of a technical investigation into the causes of the accident which recently took place at Farnborough to be published.

Aeronautics and The Law

THE USQUE AD COELUM DOCTRINE "WARNED OFF."

By "THE LINCOLN IMP."

Mr. Bickmore in a learned and interesting letter (see THE AEROPLANE for May 7th) comes to grips with the Imp on the *usque ad cœlum* doctrine. A technical letter calls for a technical reply which cannot but appear dull and forensic to a non-technical reader. Let such an one, therefore, be warned and desist.

On Cabbages and Kings.

By way of clearing decks for action, the Imp finds he can jettison a large portion of Mr. Bickmore's letter. To wit, that portion which deals with the sovereign rights of the State. Mr. Bickmore's views on this topic were anticipated by the Imp in his first article, "Trespassers, Beware!" In that article and in Mr. Bickmore's letter a distinction is drawn between cabbages ("to fly over his cabbage-patch" and kings "sovereign rights *usque ad cœlum*"). In spite of Mr. Bickmore and the Walrus, the Imp is of opinion that the time has not yet come to speak of the latter, and he intends for the present to confine himself to the topic of the private rights of private owners *usque ad cœlum*.

Unchallenged Authorities.

The Imp in "Goshawks" traced the Latin tag, "Cujus est solum ejus est usque ad cœlum," to Coke upon Littleton as its origin. Coke there stated as a fact that this Latin tag had been "holden," *i.e.* decided, in three old cases, the reference to which in the year-books he gives. The Imp next proved that these three cases did not decide anything of the sort. Mr. Bickmore makes no attempt to challenge the Imp on any of these points.

Next, the Imp quoted more modern authorities, in which Lord Ellenborough and Lord Brampton had expressly denied that "interference with the column of air superincumbent on the close" or "firing in vacuo" was a trespass. These cases are passed over by Mr. Bickmore in silence.

Some Contradictory Cases.

The line which Mr. Bickmore does adopt is that of adducing two other authorities which have the appearance, as he states them, of contradicting the cases on which the Imp placed reliance. These two cases, however, will repay a closer examination than Mr. Bickmore has given them.

Horizontal Hereditaments.

The Eastcheap-Philpot Lane case is Corbett v. Hill, a well-known authority dealing with what are called "horizontal hereditaments." This action, as Mr. Bickmore says, was based on trespass, and an injunction was claimed—but then it was refused, which takes the sting out of the tail!

It is material to understand the peculiar facts of the case. Corbett had once owned the two houses, Nos. 15 and 34. He conveyed No. 34 to Hill, who pulled it down, and in so doing disclosed a first-floor room of No. 15 which had projected beyond the ground site into No. 34. Hill proposed to rebuild No. 34 over this first-floor room as the old house had been built. Corbett said, "No. The air over my room is mine, and you will be a trespasser if you build there."

The decision in the case was that Hill might build as he intended, and would not be a trespasser. It is material to notice (a) that it was expressly *not* decided that the projecting first-floor room belonged to Hill, the owner of the *solum* or site, and (b) that the air-space in question had already been occupied by bricks and mortar.

The decision really was that the upper storeys of No. 34 had been conveyed by Corbett to Hill and their removal did not prevent Hill from building in the air-space which they had occupied. It is true that the Court prefaced its order by declaring its opinion that the column of air over the projecting room passed by the conveyance of the ground site, but there was no reference made to *usque ad cœlum*, which is the portion of the tag which is obstructive to reasonable flying.

Legal Presumption.

The Imp must concede to Mr. Bickmore that the observations made by the K.C. went beyond what was necessary for the decision of the case: "Now the ordinary rule of law is that whoever has got the *solum*—whoever has the site—is the owner of everything up to the sky and down to the centre of the earth." But then he went on: "But that ordinary presumption of law, no doubt, is frequently rebutted by the fact that other adjoining tenements protrude themselves over the site." The phrase which the K.C. used—viz., presumption of law—gives a clue to the real origin and meaning of the maxim, a meaning which renders it no obstruction at all to the development of flying.

In strictness it is a rule of evidence and not a proposition of substantive law. There are precisely analogous presumptions of law that a conveyance of land adjoining a road passes the property in the soil of the road *usque ad medium viæ*, and that a conveyance of land adjoining a river passes the property in its bed *usque ad medium filum aquæ*. "It is a law of conveyancing that *prima facie* where a man grants land on the bank of a river, having himself the soil *ad medium filum*, the soil *ad medium filum* passes by the grant."

Paraphrasing these words of Kay, J., in Tilbury-v. Silva, we may say: "It is a law of conveyancing that *prima facie* where a man grants land, having himself the air-space above it, the air-space, as far as he has it, even *usque ad cœlum* passes by the grant."

Unfortunately the qualifying words, being of little or no importance until flying was invented, have dropped out of the rule as commonly stated. The rule could not, however, be more neatly or accurately put than by the late Lord Chancellor in a very recent case: "The word 'soil' is apt to denote the surface and everything above and below it."

Constellations or Ceiling?

The rule is a rule of conveyancing, and lays down what is included in such words as "terra," "solum," or "land" in the parcels. It has nothing to say to the question, "Can a private individual own a bit of heaven or hell?"

It answers this question thus: "*If* he can, he can convey it to another by using the word 'land,' and will be taken to have done so in the absence of some reason to the contrary." Possession and ownership of the sky is a question of fact, in the ultimate analysis, which up to the present and even now must be answered

in the negative. After all, what is this *cælum?* Is it that which Addison has so finely said :

"The starry firmament on high,
And all the blue ætherial sky,"

or is the *cælum* what constructors and pilots call "the ceiling" of an aeroplane? That is the highest attainable point.

The Tunnel Case.

We must hasten to the second of Mr. Bickmore's authorities. The tunnel case does not give him all the support he seeks to draw from it. True it is that *it was said* there that ownership of the surface gives ownership of everything above the surface *usque ad cælum* and of everything below. But by whom was it said? By counsel in arguing, and not by the judge in his judgment.

The judge thought it sufficient to say that "so much of what is beneath as is necessary for the enjoyment of the surface" was the depth to which the rights of the surface owners went. This qualified statement of the doctrine is very reminiscent of the judgment of Brook, J., in the Bishop of London's case, where the claim made by counsel went *jusqu'al firmament.* The judge carefully qualified his judgment thus : "And so all the earth in which it grows in depth and all the air which nourishes it in height belongs to him to whom the tree belongs." Even Mr. Bickmore in his letter applies the same test : "Ownership *and possession* [Imp's italics] of the superincumbent space lying above the site is essential to the full enjoyment of the site or surface of the earth itself." Does Mr. Bickmore already *possess* a mansion in the skies? Does he find its possession essential to the enjoyment of his home on the earth?

A Trespasser Who Commits No Nuisance.

Mr. Bickmore also cites some old cases of nuisance and some distinctions which have been drawn between air-space and currents of air. His remarks on these topics were worth writing in this connection, and well repay reading, but the Imp is not called on to answer them because they are not relevant to the sole topic the Imp is here discussing—whether flying involves trespassing. An aeroplane at 20,000 feet commits no nuisance to the cabbage-patch of an allotment-holder, but is it trespassing on his property? As the law stands, Mr. Bickmore thinks it is. The Imp begs to differ.

THE INQUEST ON CAPTAIN RAWLINGS.

Mr. J. T. Coggins, deputy coroner for Aldershot, opened the inquiry at the Cambridge Hospital, Aldershot, on May 28th, into the death of Captain Percy T. Rawlings, D.S.C., D.F.C., R.A.F., late R.N.A.S., who died from injuries received in the accident which took place during the trial of the Tarrant triplane at Farnborough Aerodrome, on May 26th. Capt. Rawlings was general manager of the Aircraft Department of Tarrants, Ltd. The machine had been built and prepared for its trial flight under the personal direction of Mr. W. G. Tarrant, the designer and constructor.

Mr. C. W. M. Price represented Mr. Tarrant, who was also present. Mr. Walter Frampton appeared for Messrs. Ogilvie and Partners, aeronautical engineers.

The Coroner told the jury that he had summoned them, as the inquiry was a matter of public interest.

The Coroner added that an inquiry was being made into the disaster, but the report of the experts had not yet been issued, and, in order to give the experts an opportunity of making their report, and also particularly to give Mr. Tarrant an opportunity of calling a witness who was injured in the smash, he proposed to adjourn the inquiry for a fortnight, after taking evidence of identification.

Mr. Price suggested an adjournment of three weeks, and the Coroner agreed.

The foreman of the jury expressed regret at the accident, and sympathy with the relatives.

The Coroner concurred.

Mr. Tarrant : I should like to express my very great sorrow and sympathy with the relatives on this occasion, and to say how very much I appreciated the efforts of Captain Rawlings in assisting in the construction of this machine. He was quite as keen on the machine as I was. Nothing I can say can sufficiently express all that he has done.

Mr. W. Brook-Sayers, Colonel Ogilvie, and the Sperintendent of the Royal Aircraft Establishment associated themselves with the expression of sympathy.

The inquiry was then adjourned until June 18th.

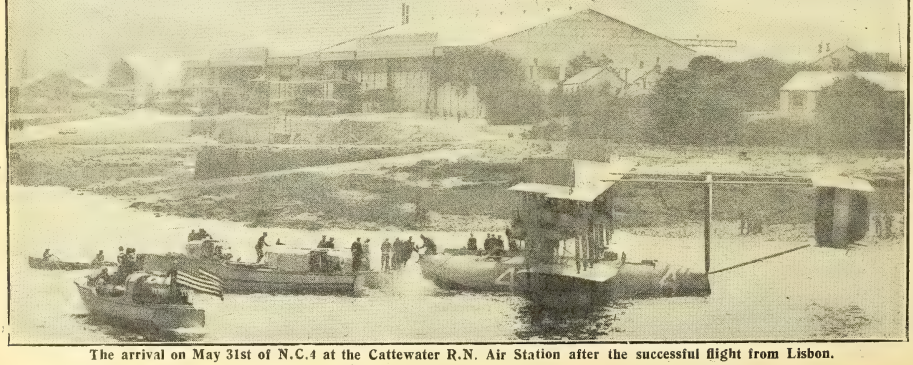
AN ACCIDENT IN ITALY.

On May 18th Lieut. Prince, R.A.F., and Lieut S. Spratt, R.A.F., were killed in an aeroplane accident at Centocelle aerodrome, Italy. Colonel Lawrence, R.A.F., another occupant of the machine, a Handley Page, was injured and two mechanics were hurt, but not seriously. The accident was caused through a bad landing owing to the dusk. This machine, in company with another, had left Marsilles that morning, making a short stay at Pisa, and it is stated that no warning of their departure from Pisa was given. The second machine landed in safely. King Victor Emmanuel paid a visit to the injured men in hospital.

THE R.A.F. AND RABIES.

The official at the Board of Agriculture who is mainly responsible for the administration of the Rabies Order stated on May 31st that information recently obtained satisfied the Board that many officers of the Royal Air Force were flagrantly disregarding orders and were smuggling dogs into this country from France and Belgium.

It should not be possible for any dog to be brought into a camp without the knowledge of the officer commanding, and he had no doubt some responsible officers knew what was going on. This official suggested that if offenders were promptly dealt with by court-martial it would probably have a salutary effect. Many offenders who were just about to be demobilised did not mind the risk of being caught; but a smart sentence, carrying with it the loss of gratuity, would probably stop these reprehensible practices.



The arrival on May 31st of N.C.4 at the Cattewater R.N. Air Station after the successful flight from Lisbon.

THE TRANS-ATLANTIC COMPETITION.

On May 28th, Mr. Hawker and Lieut.-Commander Mackenzie-Grieve were received in audience by H.M. the King, who decorated them with the Air Force Cross. Later they were introduced to the Queen and the Prince of Wales.

The "Lake Charleville," an American steamer, picked up, on May 23rd, the Sopwith aeroplane abandoned by Mr. Hawker. The position of discovery was latitude 49.40 N. and longitude 29.08 W. The mails on board were recovered.

THE AMERICAN ATTEMPT.

The N.C.4, under the command of Lieut.-Commander Read, U.S.A., left Ponta Delgada at 10.18 a.m. (G.M.T.) on May 27th and reached Lisbon on the same day at 8.4 p.m. (G.M.T.).—

On May 30th the N.C. 4 left Lisbon at 5.20 a.m. for Plymouth. Owing to adverse winds, she was forced to alight in the Mardego river. Rising later, she was flown to Ferrol, alighting there at 4.35 p.m. (G.M.T.).

At 6.27 a.m. (G.M.T.), on the following day, the N.C.4 left Ferrol for Plymouth. The weather was squally, with fairly thick cloud. Only the destroyers were sighted. Brest was reached at 11 a.m. (G.M.T.), but the seaplane did not alight. After circling over the harbour she was flown direct to Plymouth, passing frequently through heavy rain. The wind was adverse, and progress was slow. Plymouth was sighted at 1.12 p.m. (G.M.T.), and the machine alighted at 1.30 p.m. (G.M.T.)

Three British flying-boats (F.2a type), under Major R. K. Kershaw, escorted the American boat into harbour.

The following table gives the various stages of the flight.

	Miles.	Time hrs.	min.
May 8th-10th.			
Rockaway to Trepassey	950	—	—
May 16th.			
Trepassey Bay to Horta	1381	15	18
May 20th.			
Horta to Ponta Delgada	169	1	45
May 27th.			
Ponta Delgada to Lisbon	925	9	44
May 30th-31st.			
Lisbon to Plymouth	895	10	20

Lieut.-Commander Read, who landed at 4 p.m. at the Barbican, at the point from which the crew of the "Mayflower" left for their historic voyage to America, was received by the Mayor and the local Naval, Military, and R.A.F. staffs, as well as by the crews of N.C.1 and 3. Lieut.-Commander Read proceeded to London on Saturday last, where he also had a reception which proves that we are, as a race, not ungenerous to foreigners.

ANOTHER ENTRANT?

It is rumoured that Miss Ruth Law, who has attained distinction as a pilot in America, intends to compete for the prize. She is said to have chosen a Curtiss flying-boat as the most suited to the conditions of the flight.

OTHER COMPETITORS.

The Vickers and Handley Page biplanes are both rapidly nearing completion in Newfoundland.

Messrs. Boulton and Paul have selected Major K. S. Savory, D.S.O., R.A.F., and Captain Woolner to pilot the first of their two biplanes entered by the firm. Captain A. L. Howarth is to be observer and wireless expert.

THE BRITISH AIRSHIPS.

It is stated that an attempt will probably be made to fly the Atlantic some time next month by either the "R.33" or the "R.34," both of which are Admiralty airships.

A CONSOLATION PRIZE.

Lieut.-Commander Grieve, A.F.C., and Mr. Harry Hawker, A.F.C., were the guests of honour at a luncheon given at the Savoy Hotel by the proprietors of the "Daily Mail" on May 28th. Major-Gen. the Right Hon. J. E. B. Seely, C.B., C.M.G., D.S.O., M.P., handed them a cheque for £5,000 given by the "Daily Mail" as a consolation prize.

The majority of the speeches were up to the average standard of mediocrity, but Mr. Hawker said modest and effective words that pleased the gathering.

He began by thanking everyone for taking so much notice of "our feeble effort." There was hearty laughter when he went on to say, with evident sincerity, that there was not a man present who would not have done the same thing

The position, he pointed out, was simply this, that owing to the long delay people on the other side began to think there must be some reason why they did not start. It even went so far as statements in the papers that as soon as the Americans got to the other side Hawker and Grieve would pack up and go home.

"I don't think they knew us," he said. "We had decided the night before the start that if we didn't go to England we would go to the Azores, and on to Portugal, because, you see, there was an easterly gale which at that time made it impossible to reach England. But the weather improved. It was very unfortunate for Raynham that he couldn't get off with an east wind, and very fortunate for us that we could."

Lieut.-Commander Mackenzie-Grieve confessed that at one time he had been a bit frightened about the navigation of the aeroplane. On leaving St. John's he had no idea how things would pan out, but he said to himself: "Here's the sea. We must navigate her as we do a ship at sea, and we must regard the clouds as our horizon—with certain technical differences, of course."

THE ROYAL AERO CLUB'S TRIBUTE.

Lieut.-Commander Grieve and Mr. Hawker were entertained to lunch by the Royal Aero Club at the Savoy on May 30th. Brig.-General Sir Capel Holden, the Chairman, proposed the health of the heroes of the day, and explained that this was not a formal reception but purely a family gathering of the members of the Club to welcome the return of one of their members and his companion in danger. Mr. T. Marlowe, of the "Daily Mail," supported the toast.

Lieut.-Colonel Frank McClean, who was described by the Chairman as the father of British Naval Aviation, also supported the proposal. He was received on rising with almost adequate applause, and said, after a brief tribute to Mr. Hawker's pluck in starting despite adverse conditions, that Lieutenant-Commander Grieve's navigation was one of the finest pieces of work of its kind ever done—a statement which was received in a manner which left no doubt as to the appreciation of the fact by the members of the Royal Aero Club.

Mr. Hawker and Commander Grieve returned thanks with the maximum efficiency, averaging about a dozen words each and sustaining their reputation for being "men of deeds, not of words."

Mr. T. O. M. Sopwith also replied to the toast, and gave some interesting details of the flight which had not been published. He said that when he found that the engine was overheating, Mr. Hawker brought the machine down from above the clouds somewhere over 10,000 feet to under 1,000 feet before he found clear air. Being below the clouds Commander Grieve's job as navigator ceased, and he promptly went to sleep. Some hours afterwards he woke up and casually inquired whether Mr. Hawker had found a ship yet As Mr. Sopwith remarked, "you can't beat a man like that."

Another interesting fact disclosed by Mr. Sopwith was that one of the first things which the pair asked after he had met them at Grantham was that they should be allowed to have another shot at the trans-Atlantic flight. He then announced that the firm did not intend to try again, as it had had its chance, but that he wished all the other competitors better luck than they had had. Mr. Sopwith finished by tendering the congratulations of all present to the Americans who had succeeded in crossing the Atlantic by air, a sentiment which was loudly applauded.

Major-General Sir Sefton Brancker, K.C.B., proposed the health of the Chairman with a brevity only matched by the speeches of the guests of the day.

THE SOPWITH AT SELFRIDGE'S.

On June 2nd and for some few days to come the remains of the Sopwith aeroplane flown by Mr. Hawker on his attempt on the Atlantic flight may be seen by those sufficiently interested on the roof of Selfridge's, Oxford Street, W.1. There is no charge for admission.

ATLANTIC WEATHER.

The following is taken from the "Times" on June 3rd:—

Sir,—It may be of interest to mention that in 1857, previous to the laying of the first Atlantic submarine cable, I was on the staff of that company under its engineer, Mr. (afterwards Sir Charles) Bright, and I had the duty of making an analysis of the weather in the North Atlantic from the logs of the Cunard Royal mail ships—Liverpool to Halifax and Boston—for the years 1854-55 and 1856, for the months of June, July, and August, to find the time most favourable in atmospheric, sea, and ice conditions for laying the cable.

I remember about the first week in July to the first week in August was decided upon as being the most suitable, and my subsequent experiences in 1865-66 and 1869 in laying those Atlantic cables with Sir Samuel Canning confirmed that time. It is true you are always liable to a summer gale, but not often to real bad weather. This information may interest your readers and the flying world whom we all so much admire.—Yours obediently,

JOHN TEMPLE, C.B.

Aigburth, Liverpool, June 2nd.

MR. PRODGER'S TRANS-ATLANTIC ATTEMPT.

Mr. Clifford B. Prodger states that though he endeavours to make a trans-Atlantic flight he is unable to state definitely the type of machine in which he will make the attempt.

PILOTS FOR THE FAIREY SEAPLANE

The Fairey Aviation Company, of Hayes, Middlesex, announce that they do not require more pilots for the trans-Atlantic Flight. Those who have applied but have not yet had a reply will receive one in due course.

A HISTORY OF THE R.N.A.S.

Sir,—I believe that I express the sentiments of all former officers and men of the late Royal Naval Air Service when I make the suggestion that a concise and complete history and record of the work of the Royal Naval Air Service, published in book form, would fill a gap in our war records very desirably, and would be most warmly received by all former members of that Service.

There have been references quite frequently to the work or history of the R.N.A.S. in many of the popular books on the subject of war-flying in its many aspects. There have been letters published dealing with the life and work of aviators in this Service. There have been very condensed reports of the work of the Air Forces attached to Naval commands in many of the official War Office and Admiralty reports, some of which have been published, but many more filed away and unpublished.

Now that the war-time censorship has been removed, why should not a complete and collected account, compiled by a capable person who has access to all sources of records and references, be published as a memorial of an extinct Service, and as a history and record for the many men who are proud to have once belonged to such a select and distinguished Service? Such a book, I suggest, would be a worthy acquisition to the bookshelves reserved for war or aeronautical works, and would be in demand by the large number of members of the Flying Services.

May I take the liberty of offering the following general plan of such a work, as I should like to see it treated?

A Record of the Work of the Royal Naval Air Service.

I.—Instigation and Establishment of the R.N.A.S.

II.—Air Work in conjunction with the Fleets.

III.—Bombing Operations:—

1. North Sea and Belgium.
2. France, Germany, etc.
3. The Near, Middle and Far East.

IV.—Fighting Operations of the R.N.A.S. on the various Fronts.

V.—Anti-raid and anti-aircraft work in Britain.

VI.—Anti-submarine work.

VII.—Observation work (spotting, reconnaissance, balloons, airships, etc.)

VIII.—Conclusion—the transformation of the R.N.A.S.

Each chapter or section should take the form of a separate small history in itself, dealing with the development of machines and methods, the actual operations, and the splendid work and results of the more noteworthy of the Service heroes. The book will be really interesting, I believe, only as it is interspersed through every chapter with numerous cited incidents and adventures. Therein lies the popularity of the excellent record of "Submarine and Anti-submarine" work, by Henry Newbolt, and other similar books. To read of the achievements of our comrades, known or unknown, cannot fail to arouse in us a greater pride than ever in the Service to which many of us were once privileged to belong.

I am writing this in the belief that at the present time no book such as I suggest exists. If there is such a work, of which I am ignorant, I shall be very grateful indeed to learn of it.

I hope that this subject may be carefully considered and taken up in the interests of the Air Services, and particularly of the Royal Naval Air Service. In these times when history is being made day by day, we should have a careful record for the use of future generations whose business is to write the history of the past from the best records they can obtain. To our own generation, also, such a record should appeal very much. I should be glad if you would direct this letter to the attention of those best able to give it careful thought. I am not writing it merely for myself, but under the conviction that it is expressive of the desire of the whole Service, and that it is in the interests of that Service. Therefore, I trust that it will be accorded the attention that such a general desire merits.

Kenneth P. Fikkwood.
Lieut., R.A.F. (ex-R.N.A.S.)

AVIATION IN RUSSIA.

The following letter was published in the "Times" of May 26th:

Sir,—The war has been the means of bringing aviation to a high standard. The armies' and navies' enormous demands for the output of aeroplanes have greatly developed this branch of British industry. The present difficult lies in finding a solution of applying aviation to civil life. The latest efforts in endeavouring to cross the Atlantic and establish air communication with India unfortunately show that our hopes cannot as yet be realised of making aviation (in the near future) a serious and reliable competitor with other existing means of communication in this country.

I should, therefore, like to draw the attention of the British public to the one important solution which would most certainly support and develop this young branch of British industry, and at once render her practical and most useful. Russia, one of the greatest and flattest countries in the world, with any amount of natural landing ground, suitable climate for aviation as regards wind and fog, will be left practically without any means of communication at all.

The Bolshevists, whose downfall is now a matter of a few weeks, will be replaced by a staple and strong Government. But two years of civil war have entirely destroyed all railway traffic. The state of roads renders motoring almost an impossibility. River traffic is slow and out of the question during the winter months.

I therefore most emphatically state that Russia, in her present state, as well as in the near future, offers an unique opportunity for the immediate development of civil aviation without almost any sort of competition from other means of communication.

The development of air lines in Russia between various parts of the country would be of an enormous value to the future Government. It would help to reinstate order easier and quicker, and help Russia to attain a normal existence once again. Aviation would find a noble scope, and exist not only as a military weapon for destruction, but be the means of reconstructing a large country, which has for so long suffered at the hands of the evil genius of destruction.—P. Shishkoff (formerly Director of Aircraft Experiments, Russian Navy).

A SMITTEN CRITIC.

Sir,—May I be permitted to make a somewhat belated reply to your critic's remarks on my book, "Air Men o' War."

First, "R. H. B." strafes me severely for the title of my book, which he refers to as "*Airmen* o' War." May I point out that this is either a direct misrepresentation or such a casual reading as a critic may reasonably be ashamed of. The title printed on the cover, on the title page, the Dedication, and everywhere else is clearly and distinctly and intentionally "Air Men o' War." Your critic is the only person I have found object to the title, or fail, as he apparently does, to understand it. I might certainly have called it "Men o' War of the Air," or "Flying Officers, N.C.Os., and Men of War," or something else more intelligible to your critic's understanding, but I still prefer my own title. I have not seen "Airmen" flaunted in any review but The Aeroplane's, or on any bookstall. They reviewed and showed "Air Men——."

"R. H. B.'s" bitter objections apparently are based on the assumption that, as he puts it, "An 'airman' is one of those depressed-looking beings that carry deboshed petrol cans about, whistling curious dirges between their teeth. Something in armoured boots for preference,' etc., etc.

I want to protest as vigorously as I can against this and other unpleasant and unfair running down of a class of men who, to my own knowledge, not only did their own job on the ground well, and in the 'dromes had to stand frequent and unpleasant doses of bombing and machine-gunning and long-range shells, but also from their ranks provided many pilots and observers and aerial gunners who flew as Officers, N.C.Os., and Men, earned decorations, and generally were a credit to the Force to which they belonged.

Is "R. H. B." aware of the fact that McCudden started as a mechanic, and was in no way ashamed of the fact, or does he despise Mac as a one-time "depressed-looking being," etc., etc. And I could string off a list of names of men who were "airmen" and also flying men that the R.A.F. was proud of.

Curiously enough, "R. H. B." singles out as "the best tale of the lot," a story which describes the work of some of those "depressed-looking," etc., and I might have hoped it would have given him some idea of part of the strenuous life of the men on the ground, and led him to leave out his insulting remarks on good men.

"R. H. B." kindly refuses "to harp on the occasional mishandling of technical minutiae," but he at least might have quoted me correctly and not mishandled my mishandling, as in the paragraph he holds up to scorn "jerking flashes of the machine-gun that blazed along her propeller." I wrote "through her propeller," which I think expresses my meaning, although I ought perhaps to have written "airscrew" and quoted the language of the C. C. Gear Handbook to avoid "mishandling."

"R. H. B." may be critic and judge enough of writing to entitle him to find fault with my style and my pages "thickly spangled with adjectives," but will he allow me to point out gently that the reproof, coming as it does on top of his sentence on the "depressed-looking beings," "deboshed petrol cans," "curious dirges," "armoured boots" sounds rather like "Satan reproving sin." I doubt if even I average four single- and double-barrelled adjectives to five consecutive nouns.

And even I in my worst "dazzle-writing" have not been guilty of his expression "Poilu of the Blue." "I say it very loud and clear," Mister R. H. B., even as you say about the depressed dirge whistlers, that "Poilu" is the French nickname for their unkempt, untidy—if I may borrow the witty adjective—"deboshed" infantry of the line, literally the bearded, the hairy ones. "R. H. B." may scorn my "Air Men" title, but I'm conceited enough to prefer it to "Poilu (Hairy Ones) of the Blue," or even "Intrepid Aviators" or "Birdmen."

(Signed) Boyd Cable.

NAVAL & MILITARY AERONAUTICS

FROM THE "LONDON GAZETTE."

ADMIRALTY, May 27th.

The King has been pleased to approve of the award of the following decorations to the undermentioned men :—

MERITORIOUS SERVICE MEDAL.

Air Mech (1st Cl.) F. Hainsworth, R.N.A.S.
C.P.O. (3rd Cl.) P. H. Brooks, R.N.A.S., O.N.F. 12795.

AIR MINISTRY, May 27th.

The following temp appointment is made at the Air Ministry :—
Director.—Lt.-Col. (actg. Brig.-Gen.) C. L. Courtney, C.B.E., D.S.O., and to retain the actg. rank of Brig.-Gen. while so empld., from March 1st to April 30th.

The following. temp. appointments are made :—Staff Officer, 1st Cl.—(Air.)—Maj. H. A. R. Aubrey, O.B.E., M.C., May 1st.

Staff Officer, 2nd Cl.—(Fr.)—Capt. J. S. T. Bradley, on relinquishing the appointment of S.O., 1st Cl., vice Lt. H. J. G. Newman, M.B.E., May 31st.

FLYING BRANCH.—Majs. to be graded for purposes of pay and allowances at Lt.-Cols. (A.) :—T. O'B Hubbard, M.C., A.F.C., while so empld., May 1st; C. F. Portal, D.S.O., M.C., while so empld., May 1st.

Maj. J. T. Babington, D.S.O., to be graded for purposes of pay and allowances as Lt.-Col. (A. and S.) while so empld., from May 1st to May 18th.

Maj. O. T. Boyd, M.C., to be actg. Lt.-Col. while so empld., from Jan. 15th to April 30th.

Capts. to be graded for purposes of pay and allowances as Majs. while empld. as Majs. (A.) :—(Hon. Maj.) F. B. Binney, C. H. Darley, D.S.C., D.F.C., D. G. Donald, H. S. Kerby, D.S.C., A.F.C., L. L. MacLean, C. E. H. C. Macpherson, R. D. Oxland, W. R. Read, M.C., H. A. Smith, M.C., E. R. Vaisey, May 1st.

Capts. to be graded for purposes of pay and allowances as Majs. while empld. as Majs. (A. and S.) :—E. G. Hopcraft, D.S.C., F. J. Linnell, C. H. C. Smith, May 1st.

Capts. to be graded for purposes of pay and allowances as Majs. while empld. as Majs. :—G. G. Cooke, D.S.C. (Ashipl), J. Wann (K.B.), May 1st.

Capt. (actg. Maj.) M. Le Blanc-Smith to be Capt. (A.), and relinquishes the actg. rank of Maj. on reduction to estbt., April 24th.

Capt. W. G. Pigott to be graded for purposes of pay and allowances as Capt. while empld. as Capt. (K.B.), from April 1st, 1918, to July, 8th, 1918.

To be actg. Capts. while empld. as Capts (A.) :—Lt. (Hon. Capt.) H. B. Russell, from Nov. 1st, 1918, to April 30th; Sec. Lt. S. King-Smith, from (T.), from Dec. 13th, 1918, to April 30th.

Lts. to be graded for purposes of pay and allowances as Capt. while empld. as Capts. (A.) :—G. Andrews, H. M. Coombs, D.F.C., E. D. G. Galley, A.F.C., A. J. H. Jeplson, A. G. Lamplugh, H. M. Moody, M.C., W. G. Preston, D.F.C., A. W. Reid, M.C., H. L. Rough, D.F.C., G. S. White, H. J. Whittingham, May 1st.

Lts. to be graded for purposes of pay and allowances as Capts. while empld. as Capts (A. and S.) :—W. K. Curtis, A. W. Fletcher, A.F.C., J. K. A. Jeakes, D.F.C., M. H. Rattray, May 1st.

Lt. T. A. Byers to be graded for purposes of pay and allowances as Capt. while empld. as Capt. (K.B.), May 1st.

Sec Lts. to be graded for purposes of pay and allowances as Capts. while empld. as Capts. (O.) :—L. J. Chandler, D. G. Fleming, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Lts. while empld. as Lts. (O.) :—J. Bowen, W. H. Dinnion, T. O. Harvey, P. J. Hayes, A.F.C., K. C. McKenzie, A. Neeson, W. Smith, W. A. Thompson, H. J. White, May 1st.

Sec. Lts. to be Lts. :—(Hon. Lt.) A. B. Clark, M.C., April 6th, 1918; H. W. Kelly, May 10th, 1918; J. Hackett, Oct. 26th, 1918.

W. L. Heinus (temp. Capt., Ont. R.), is granted a temp. commn. as Sec. Lt. (A.), Sept. 16th, 1918, and to be Hon. Capt.

Ft. Cmdt. G. J. Cross is granted a temp. commn. as Sec. Lt. (A.), Aug. 12 th, 1918.

The following are granted temp. commns. as Sec. Lts. (O.) :—L. R. Griffin, M.M., (Sec. Lt., R. Berks R., T.F.), C. W. K. Hodges Sec. Lt., Norf. R., T.F.), Nov. 9th, 1918.

The following are granted temp. commns. as Sec. Lts. (K.B.) :—T. C. W. Haynes (Lt., Manch. R., Spec. Res.), and to be Hon. Lt., H. A. B. Brough (temp. Sec. Lt., M.G. Corps), S. V. Evans (Sec. Lt., Notts and Derby R., T.F.), H. D. Lowe, Sec. Lt., W. Kid. La., T.F.), H. McA. Peacock (temp. Lt., R. Fus.), and to be Hon. Lt., Oct. 29th, 1918; A. T. T. Sleed (temp. Sec. Lt., Gen. List, S.A.), Nov. 10th, 1918.

The following relinquish their commns on ceasing to be empld. :—Lt. (actg. Capt.) G. E. Wait (Capt., W. Ont. R.), Dec. 12th, 1918; Lt. A. L. Galbraith (Lt., Lond. R.), Dec. 18th, 1918; Lt. N. H. Raikes (Lt., Canadians), Jan. 1st, Sec. Lt. (Hon. Lt.) C. Frey, M.M. (Lt., Sask. R.), Jan. 9th; L. G. M. Morrison (Lt., New Bruns. R.), Jan. 14th; Lt. R. H. Kelley (Lt., Quebec R.), Feb. 3rd; Sec. Lt. (Hon. Lt.) J. C. Kennedy (Capt., Arg. and Suth. Highrs.), Feb. 20th; Lt. W. E. James, M.C. (Lt., Sask. R.), Feb. 20th; Lt. M. R. Chidson (Lt., R.G.A.), March 24th; Lt. (Hon. Maj.) A. G. Lincoln (Maj., E. Ont. R.), March 31st; Sec. Lt. T. Clarkson (Lieu. R.), April 4th; Sec. Lt. (Hon. Lt.) R. J. Weatherhill (C. Ont. R.), May 4th; Lt. (Hon. Capt.) R. F. Ward, M.C., D.F.C. (Capt., R. Welsh Fus.), May 7th; Lt. (actg. Capt.) C. F. Falkenburg, D.F.C. (Lt., Quebec R.), May 9th; Sec. Lt. A. Lewin, May 12th (substituted for notification in "Gazette," March 4th); Lt. G. D. Gillie, M.C. (Lt., E. Ont. R.), May 15th.

Transferred to unempld. list :—Lt. J. F. Alcock, Jan. 20th; Sec. Lt. R. Walker, Feb. 1st; Lt. H. D. Humphreys, Feb. 2nd; Lt. E. Wilson, Feb. 4th; Sec. Lt. A. Shaw, Sec. Lt. E. Smith, Capt. H. G. Watson, Feb. 7th; Sec. Lt. C. N. Yeoman, Feb. 20th; Lt. H. S. Welby, Feb. 25th; Sec. Lt. A. T. Veness, March 1st; Lt. M. L. Williams, March 3rd; Lt. M. L. Snelling, March 4th; Sec. Lt. F. H. Allan, Sec. Lt. T. H. Allan, Sec. Lt. P. C. Armstrong, Sec. Lt. F. C. Armstrong, Sec. Lt. F. C. Murray, March 7th; Lt. F. H. Chainey, Sec. Lt. C. Wilkinson, March 14th; Sec. Lt. R. H. Masterman, Sec. Lt. L. A. Willmore, March 18th; Lt. C. P. Shilton, March 24th; Capt. (actg. Maj.) A. M. Shook, D.S.O., D.S.C., Lt. T. P. W. Young, March 28th; Sec. Lt. H. C. Anderson, Sec. Lt. St. C. McG. Martin, March 31st; Sec. Lt. G. T. Beges, Sec. Lt. F. H. Coppock, Sec. Lt. J. Elliott, Lt. W. G. Foster, Sec. Lt. T. C. Fraser, Sec. Lt. C. G. Grant, Lt. H. D. McKay, Sec. Lt. D. St. C. MacDonald, Sec. Lt. F. E. Place, April 1st; Lt. J. A. Fleming, April 2nd, Lt. R. A. Manly, April W. Young, March 28th; Sec. Lt. H. C. Anderson, Sec. Lt. C. Mc G. 3rd; Capt. D. D. Findlay, Sec. Lt. C. V. Forsyth, Lt. A. G. Wilson, April 5th; Maj. J. G. Swart, M.C., Sec. Lt. J. N. Schollield, April 8th; Lt. F. Duify, Lt. D. T. Forbes, Sec. B. Solomons, Capt. G. F. Ward, April 9th; Lt. F. H. Hayns, Lt. G. A. Hogg (K. Highrs.), Sec. Lt. C. Skinner, Capt R. B. Wann, April 10th; Sec. Lt. C. D. Smith, Lt. E. A. Sullock, Sec. Lt. J. A. Senior, Sec. Lt. A. A. Swait, April 11th; Sec. Lt. K. M. Freshwater, Lt. W. W. Sharpe, Lt. W. B. Ward, D.F.C., April 12th; Sec. Lt. C. O. Carson, Capt. R. D. Delamere, D.S.C., Sec. Lt. (Hon. Lt.) F. Egerton, Lt. S. C. Foster, Sec. Lt. A. H. Freed, Sec. Lt. R. D. Poland (Rifle Bde.), Sec. Lt. E. D. Smith, Sec. Lt. W. E. Searle, Lt. E. G. Spooner, Sec. Lt. A. Smith, Lt. A. G. Tyrrell, April 14th, Capt. B. R. Millar, Sec. Lt. E. G. A. Peskett, Lt. G. Rooney (Royal Irish Fus.), Sec. Lt. E. M. Lt. D. H. Sadler, Lt. G. D. Shand, April 15th; Sec. Lt. L. Dickinson, Sutton, Sec. Lt. A. M. Smith, April 15th; Lt. W. E. De B. Diamond, Lt. W. S. Gregor, Sec. Lt. (Hon. Lt.) D. G. O. Hepworth, April 16th; Lt. C. H. Lee, Sec. Lt. N. M. Simpson, April 17th; Lt. G. A. Hayward, Sec. Lt. S. S. Saunders, Lt. E. Thomas, April 18th; Sec. Lt. A. M. Berry, Sec. Lt. J. L. Campbell, Sec. Lt. P. A. Clayson, Sec. Lt. W. Z. Cade, Sec. Lt. H. N. Eyre, Sec. Lt. J. B. Gunn, Sec. Lt. E. R. Moore, Sec. Lt. G. E. Meissenheimer, April 19th; Lt. G. S. Daniel, Sec. Lt. C. E. Francis, Lt. D. M. McBeath, Lt. E. J. Smith, April 20th; Sec. Lt. A. E. S. Gascoigne, Sec. Lt. A. T. Start, April 21st; Sec. Lt. F. D. Broughton, Lt. H. A. Rudge, Capt. C. W. Spencer, Lt. A. P. Snelling, Capt. F. G Saunders, M.C., April 22nd; Sec. Lt. G. H. Alexander, Lt R. J. Divers, Sec. Lt. J. S. Wharrie-Smith, April 23rd; Sec. Lt. A. A. Iker, Lt. A. E. Pintoul, Lt. C. S. Richmond, Sec. Lt. A. H. Stickle, April 24th; Lt. H. E. Ambrose, Lt. C. H. Denny, Sec. Lt. A. R. Deanus, Lt. C. A. Grant, April 25th; Sec. Lt. E. J. R. Hack, Lt. H. T. Harrison, Sec. Lt. G. Straw, April 26th; Lt. E. F. Haselden, April 27th; Sec. Lt. J. A. Ottaway, April 28th; Lt. R. Harris, Sec. Lt. G. S. Shackleton, Capt. E. G. Whelon (R. Sussex R.), April 30th; Sec. Lt. (Hon Capt.) D. T. M. Kennedy, Lt. F. A. Sedore, May 1st; Lt. J. A. Atkins, Sec. Lt. A. G. Boff, Lt. F. W. Knight, May 2nd; Lt. G. J. E. Agnew, Lt. (actg. Capt.) A. C. Atkey, M.C., Sec. Lt. F. C. Ferrier, Sec. Lt. T. T. Orde, May 3rd; Sec Lt. A. C. Anderson, Lt. C. L. Middleton, May 4th; Lt. L. W. Beal, Sec. Lt. A. E. Mileham (R.W. Kent R.), May 5th; Lt. (Hon. Capt.) J. H. H. Goodall (York and Lancs. R.), May 6th; Sec. Lt. W. C. Bonton, Sec. Lt. F. W. Barker, Lt. (actg. Capt.) J. Bussey, Sec. Lt. P. H. Burns, Lt. (actg. Capt.) N. G. Cardia, Sec. Lt. L. R. Chandler, Lt. P. V. G. Chambers, Sec. Lt. G. B. Moxon, May 7th; Lt. F. P. Adams, Sec. Lt. W. T. Allen, Sec. Lt. G. P. Ashcroft, Sec. Lt. J. A. L. Brown (Notts and Derby R., T.F.), Sec. Lt. F. K. Cleuh, Sec. Lt. R. P. Caton, Sec. Lt. T. C. Chatter (R.G.A.), Lt F. W. C. Davies, Sec. Lt. R. E. Gillispie, Sec. Lt. A. J. Hamilton, Lt. H. Kingsbury, Sec. Lt. J. D. McKeogh, Sec. Lt. N. J. Moran, Sec. Lt. M. P. Morgan, Sec. Lt. G. I. Neale, Lt. O. W. Pellatt, Lt. S. H. Warner, Lt. A. V. Wills, May 8th; Sec. Lt. H. W. Burry, Lt. H. A. Brown, Sec. Lt. A. E. Bradley, May 9th; Sec. Lt. W. Anderson, Sec. Lt. S. A. Banton, Sec. Lt. C. J. A. Berkeley, Lt. G. A. Bird, Lt. H. J. P. Bomford (Lond. R., T.F.), Sec Lt. (Hon. Lt.) P. B. Davies, Sec. Lt. H. P. C. Green, Sec. Lt. I. K. Gillispie (Army Cyc. Corps), May 10th; Sec. Lieut. A. Beedie, Lieut. E. G. Bridges, Sec. Lieut. H. D. Beresford, Lt. R. F. Gill, May 11th; Sec. Lt. F. S. Adams, Sec. Lt. F. H. Brewitt, Sec. Lt. N. Price, Lt. H. A. Pike, Lt. J. R. Pattisson, Sec. Lt. G. C. R. Parker, Capt. A. W. Vigess (R.E., T.F.), May 12th; Lt. B. A. R. Beeching, Lt. F. Noble, Sec. Lt. (Hon. Lt.) R. D. De Pass, Sec. Lt. C. R. C. Pink, May 13th; Sec. Lt. H. E. Blades, Sec. Lt. C. B Cheetham, Sec. Lt. A. Parr, May 14th; Sec. Lt. R. McC Dolbey, Sec. Lt. G. B. Fairhurst, Sec. Lt. H. Mason, Sec. Lt. W. T. Neilson, Sec. Lt. J. M. Petch, May 15th; Sec. Lt. G. H. Dixon, May 16th; Sec. Lt. R. Davison, Sec. Lt. J. M. F. McDonald, May 17th; Lt. A. W. Stupart, D.F.C., May 18th; Sec. Lt. A. W. Allis, Lt. T. A. G. Bishop, Sec. Lt. D. A. Black, Sec. Lt. C. Crossley, Lt. H. McL. Ferguson, Sec. Lt. C. Nash, May 19th; Sec. Lt. R. G. Adams, Sec. Lt. A. F. Arnold, Sec. Lt. W. J. Atheridge, Sec. Lt. W. H. August, Sec. Lt. H. F. Banks, Sec Lt. C. A. Beattie, Lt. R. F. Barnes, Sec. Lt. J. W Bellah, Sec. Lt. W. M. Bergey, Sec. Lt. K. W. Biglow, Sec. Lt. E. R. Bradley, Sec. Lt. B. R. Brown, Lt. H. F. Palmer, Sec. Lt. J. B. Badgley, Lt. W. J. Bond, Sec. Lt. H. E. Brown, Capt. H. S. Butterworth, Lt. F. J. Bourke, Lt. (actg. Capt.) R. M. Berthe, Sec. Lt. O. S. Clefstad, Lt. I. B. Calnan, Capt. A. W. Carter, D.S.C., Lt. E. O. Copas, Sec. Lt. R. B. Crawford, Sec Lt. F. Charlesworth, Sec. Lt. W. L. Case, Sec. Lt. F. L. J. Cook, Sec Lt. J. G. Callaghan, Sec. Lt. H. F. Conroy, Sec. Lt. J. W. Cruikshank, Sec. Lt. C. H. Mayes, Lt. A. L. Corson, Lt. A. Chisholm, Sec. Lt. D. M. Crater, Sec. Lt. J. Copeland, Sec Lt. P. B. Calder, Lt. F. Fredrickson, Sec. Lt. P. L. Fannen, Sec. Lt. G. F. Geiger, Sec. Lt. H. S. McFadden, Sec. Lt. C. E. Mitchell, Sec. Lt. E. J. Murray, Lt. H. A. Miller, Lt. E. G. Macpherson, Sec. Lt. W. B. Mavity, Sec. Lt. J. M. Meston, Sec. Lt. M. H. McRae, Lt. G. L. Macpherson, Sec. Lt. F. L. McArthur, Sec. Lt. A. R. Macpherson, Sec. Lt. L. W. Marwick, Sec. Lt. M. M. Nesbit, Sec. Lt. R. T. Nixon, Sec. Lt. R. G. Ostram, Sec. Lt. P. J. R. Payne, Sec. Lt. H. C. Peat, Sec. Lt. J. T. Pelletier, Sec. Lt. B. S. Philp, Lt. B. B. Perry, May 20th; Lt. O. A. Moore, Sec. Lt. D. B. Menzies, Lt. C. H. Mayes, Lt. A. McM. Philips, D.F.C., Sec. Lt. A. Porter, Sec. Lt. H. J. Philp, May 23rd; Lt. C. G. Crane, May 25th; Lt. N. B. Arbuthnot, May 26th.

Lt. J. Wingate resigns his comm. in order to resume his medical studies, and is permitted to retain his rank, Jan. 8th.

The following Lts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank :—E. Evans, Jan. 20th (substituted for notification in "Gazette," Jan. 28th); H. J. W. McConnell, May 10th; M. T. McKelvey, May 14th; L. L. Miller, May 16th.

The following Lts. relinquish their commns. on account of ill-health : —S. R. Lesley (Suss. Yeo.), W. Kirkpatrick (contracted on active service), (Lanark Yeo.), H. A. Selby (R.F.A.), May 20th.

Lt. H. Roberts resigns his comm., May 28th.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—A. S. Helmer, March 8th; H. J. Clark (contracted on active service), May 15th; P. Girvin, May 20th.

Sec. Lt. (Hon. Lt.) W. Cooke relinquishes his comm on account of ill-health contracted on active service, May 3rd.

Sec. Lt. W. H. Boite to take rank and prec. as if his appointment as Sec. Lt. bore date April 7th.

T. H. Delany is antedated in his appointment as Sec. Lt. (A.), Aug 8th, 1918.

The surname of F. G. Tolmie is as now described, and not Tomlie, as stated in "Gazette," Aug. 30th, 1918.

The notification in "Gazette," April 1st, concerning Lt. J. Wingate is cancelled.

The notification in "Gazette," Feb. 25th, concerning Sec. Lt. C. O. Carson is cancelled.

The notinication in "Gazette," March 11th, concerning Sec. Lt. H. H. Bland is cancelled ("Gazette" notice of March 14th to remain).

The notinication in "Gazette," April 29th, concerning Sec. Lt. P. C. Brazier is cancelled.

The notinication in "Gazette," Jan. 14th, concerning Sec. Lt. A. S. Helmer is cancelled.

The notinication in "Gazette," Jan. 14th, concerning Sec. Lt. H. J. Welch is cancelled.

The notinications in "Gazette," May 13th, concerning the following officers are cancelled:—Lt. F. C. Shirtcliffe, Capt. F. W. Walker.

Administrative Branch.—Lt.-Col. E. H. Davidson, O.B.E., M.C., to be Lt.-Col. on relinquishing the appointment of Deputy Director at the Air Ministry, May 1st.

Lt.-Col. D. Powell, C.B.E., to be Lt.-Col., from (S.G.), May 1st.

Capt. (actg. Maj.) N. A. Daniell to be actg. Maj. whilst empld. as Maj., from (S.O.), and relinquishes the grading for purposes of pay and allowances as (S.O.), from Jan. 7th to April 30th.

Capt. (Hon. Maj.) (actg. Maj.) R. H. Howell retains the actg rank of Maj. whilst empld. as Maj., from (S.O.), from Nov. 18th, 1918, to April 30th.

Capt. G. R. Turner to be graded for purposes of pay and allowances as Maj. whilst so empld., May 1st.

Capts. to be graded for purposes of pay and allowances as Maj. whilst empld. as Majs.:—F. V. Cowell, E. E. S. Heathcote, (Hon. Maj.) T. M. Ross, A. M. Wilson, May 1st.

Lt. W. H. Osman to be graded for purposes of pay and allowances as Maj. whilst empld. as Maj., May 1st.

Capt. R. J. G. Cample to be Capt., from (T.), May 17th.

Sec. Lts. to be actg. Capts. whilst empld. as Capts.:—(Actg. Lt.) R. E. Cunningham, from Dec. 15th, 1918, to March 21st; F. T. Dixon, from March 1st to April 30th; H. J. De Wall, from March 12th to April 30th.

Lts. to be graded for purposes of pay and allowances as Capts. whilst empld. as Capts.:—Hon. Capt.) W. C. Alexander, E. L. Ardley, N. H. Bartman, (Hon. Capt.) R. S. J. Bond-Andrews, (Hon. Capt.) T. E. Gentics, (Hon. Capt.) F. C. McBride, L. J. N. Mackay, (Hon. Capt.) F. F. McKenna, J. A. McLaren, M.C., W. J. Matthews, (Hon. Capt.) C. W. A. Millar, P. J. Murphy, G. V. Walsh, L. L. Wight, M.C., May 1st.

Lts. to be graded for purposes of pay and allowances as Capts. whilst empld. as P.T. Officers:—J. Butterfield, A. E. Chilcott, J. E. Cording, M.C., W. H. Evans, N. M. Hoskins, K. S. Hunter, R. Kane, R. E. Martin, G. L. Moss, M.C., May 1st.

E. Newman (Capt., A.O.D.) is granted a temp. commn. as Lt., Aug 8th, 1918, and to be Hon. Capt.

Sec. Lts. to be graded for purposes of pay and allowances as Lt. whilst empld as Lts.:—R. I. Raymond, W. E. Castings, G. A. Middleweek, W. J. Scarff, A. P. Johnston, G. E. Blake, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Lts. while empld. as P.T. Officers:—A. E. F. McCreary, G. H. Price, R. N. Lamb, May 1st.

Sec. Lt. (Hon. Capt.) C. B. Dick-Cleland to be Sec. Lt. from (T.), and to be Hon. Capt. and graded for purposes of pay and allowances as Lt whilst empld. as Lt., May 1st.

Sec. Lts. to be Sec. Lts.:—V. D. Smith, Dec. 7th, 1918; I. Holliday, April 17th.

Sec. Lts. (O.) to be Sec. Lts.:—W. J. Barker, Nov. 18th, 1918; J. W. Clarke, May 2nd; F. E. L. Elliott, May 7th.

The following Sec. Lts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lts.:—R. N. Preece, June 28th, 1918; J. F. Forbes, Nov. 16th, 1918; W. W. Holbourne, March 1st; R. Crang, April 17th.

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. (actg. Lt.) L. M. King-Harman (Lt., Rifle Bde.), April 2nd; Capt. A. J. R. Waller (Capt., Essex R.), May 2nd; Lt. (actg. Maj.) Hon. F. W. Bampfylde (Lt., Devon R.), May 15th.

Transferred to unempld. list:—Maj. A. N. Stuart, Jan. 14th; Lt. S. Wilmett, Feb. 13th; Sec. Lt. A. Wimpenny, Feb. 22nd; Lt. J. N. Stennett, Feb. 23rd; Sec. Lt. H. C. Scovell, March 12th; Sec. Lt. W. Cowden, March 13th, Sec. Lt. H. Vincent, May 21st; Lt.-Col Hon. C. A. Ward, M.V.O., March 22nd; Sec. Lt. G. Waugh, March 23rd; Sec. Lt. W. B. Tinker, D.F.C., March 25th; Sec. Lt. L. G. Cartwright, March 26th; Sec. Lt. M. P. Dalrymple, April 1st; Sec. Lt. L. McLeod Moffats, Sec. Lt. J. B. Rennick, April 9th; Sec. Lt. T. H. Wroughton, April 10th; Sec. Lt. A. Sharples, Lt. C. C. Statt, April 14th; Sec. Lt. W. Gow, Lt. (actg. Capt.) J. V. Hay, Lt. (actg. Capt.) M. G. Kiddy, April 15th; Capt. E. W. S. Cotterill, April 17th; Sec. Lt. G. C. Shakespeare, April 21st; Sec. Lt. E. R. Greenhorn, April 23rd; Sec. Lt. C. W. Starke, April 24th; Sec. Lt. H. T. Hayes, April 25th; Lt. J. Filkington, Sec. Lt. J. Warren-Foster, April 29th; Lt. (actg Capt.) A. T. Gammon, Lt. (actg. Capt.) P. W. Malthouse, Sec. Lt. C. F. Nurse, April 30th; Sec. Lt. R. S. Ashby, Capt. (actg. Maj.) C. Hayes, May 1st; Sec. Lt. A. Bruffton, Lt. (actg. Capt.) W. E. Cranmer, May 2nd; Sec. Lt. Pritchard, May 3rd, Sec. Lt. C. R. Calder, Sec. Lt. R. Carr, May 6th; Sec. Lt. L. Winwood, May 7th; Lt. C. B. Charlewood, May 8th; Sec. Lt. J. E. De Casmaker, May 9th; Sec. Lt. H. C. Beaumont, Lt. J. W. Parsons, May 10th; Lt. (actg. Capt.) W. F. Fletcher, Sec. Lt. F. C. Whitten, May 11th; Sec. Lt. W. Mahony, May 12th; Lt. (actg. Maj.) A. Marsh (R.N.V.R.), Capt. G. F. Wilson (Seaforth Highrs., T.F.), May 13th; Sec. Lt. H. C. Bryant, Sec. Lt. L. Glasspole, May 14th; Sec. Lt. (actg. Lt.) C. Gruchy, Sec. Lt. F. Heath, Lt. L. J. Mars, May 15th; Lt. C. C. Dufficld, Sec. Lt. F. J. Madden, May 17th; Sec. Lt. F. W. Anderson, Sec. Lt. T. Fraser, Sec. Lt. A. A. S. Milne, Sec. Lt. R. A. Patterson, Lt. W. K. Prendergast, May 20th; Lt. (actg. Capt.) C. E. Crabbe, May 22nd.

The following relinquish their commns. on account of ill-health, and are permitted to retain their rank:—Capt. J. Bushell, May 14th; Sec. Lt. J. G. Elliott, May 9th (substituted for notification in "Gazette," May 16th).

Sec. Lt. C. O. Bennett resigns his commn., May 28th.

The surname of E. H. W. Darby is as now described, and not Darley, as stated in "Gazette," Feb. 7th.

The notification in "Gazette," Feb. 14th, concerning Sec. Lt. G. P. Forbes is cancelled.

The notification in "Gazette," April 20th, concerning Lt. T. F. X. Smallwood is cancelled.

The notification in "Gazette," May 6th, concerning Capt. (Hon. Maj.) (actg. Maj.) R. H. Howell is cancelled.

Technical Branch.—Majs. to be graded for purposes of pay and allowances as Lt.-Cols. while empld. as Lt.-Cols., Grade (A.):—W. J. Fernie, O.B.E., J. G. Bayes, O.B.E., May 1st.

Capts. to be graded for purposes of pay and allowances as Lt.-Cols. while empld. as Lt.-Cols., Grade (A.):—L. B. Cook, W. W. Farthing, O.B.E., May 1st.

Maj. R. F. Le Bailly to be Maj., Grade (A.), from (Ad.), April 28th.

Capt. (actg. Maj.) D. M. P. Riach, M.B.E., to be Capt., and retains the actg. rank of Maj., Grade (A), from (S.O.), April 21 to April 30.

Capts. to be graded for purposes of pay and allowances as Majs., Grade (A), while so empld.:—A. Hunter, F. W. H. Lerwill, May 1st.

Capt. L. Auker, O.B.E., to be graded for purposes of pay and allowances as Maj., Grade (B), while so empld., May 1st.

Capts. to be graded for purposes of pay and allowances as Maj. while empld. as Maj., Grade (A):—J. D. Blyth, J. J. Botterill, A. Clayton, S. Curtis, W. J. B. Curtis, O.B.E., A. Graves, (Hon. Maj.) A. E. Hatton, W. A. B. Laing, T. Martin, O.B.E., R. K. Paton, W. O. Pearce, E. S. Sturdee, O.B.E., D. Williams, K. J. Young, May 1st.

Capt. J. T. Matthews to be graded for purposes of pay and allowances as Maj. while empld. as Maj., Grade (B), May 1st.

Lts. to be graded for purposes of pay and allowances as Majs. while empld. as Majs., Grade (A):—F. B. Adams, C. A. Doherty, H. V. Snook, May 1st.

Sec. Lts. to be graded for the purposes of pay and allowances as Majs. while empld. as Majs., Grade (A).—C. C. Lees (and to be Hon. Lt.), R. B. Stephenson, A. J. Toomer, May 1st.

Capt. H. G. Henley to be Capt., Grade (A), from (A), Feb. 17th.

Capt. W. E. G. Beaufort-Greenwood to be Capt., Grade (A), from (S.O.), May 1st.

Lts. to be actg. Capts. while empld. as Capts., Grade (A):—G. A. Lawler, from Oct. 1st, 1918, to April 30th (Substituted for notification in "Gazette," Feb. 21st); G. W. M. Whitton, from April 5th to April 30th.

Sec. Lt. J. W. Hoskings, M.B.E., to be actg. Capt. while empld. as Capt., Grade (A), from Feb. 1st to April 30th

Sec. Lt. (actg. Lt.) A. G. Ridgon to be actg. Capt. while empld. as Capt., Grade (B), from Nov. 30th, 1918, to April 30th.

Lts. to be graded for purposes of pay and allowances as Capts. while empld. as Capts., Grade (A):—H. A. Braddock, P. Burke, H. H. Chivers, A. H. Ellis, (Hon. Capt.) W. H. Ellison, R. F. Grant, G. S. Hailey, M.C., H. E. Hazlehurst, S. T. Heath, G. W. Hippisley, (Hon. Capt.) C. Hole, T. Kerr-Jones, A. H. Meldrum, (Hon. Capt.) C. R. G. Topham, G. M. W. Whitton, May 1st.

Lts. to be graded for pay and allowances as Capts. whilst empld. as Capts., Grade (B):—F. G. Diddens, G. F. Dundas, May 1st.

Lt. J. R. S. Borman to be Lt., from (Ad.), and to be graded for purposes of pay and allowances as Capt. whilst empld. as Capt., Grade (B), May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Capts. while empld. as Capts., Grade (A):—C. A. Assiter, and to be Hon. Lt. L. H. Bainton, and to be Hon. Lt., H. C. Bishop, and to be Hon. Lt., H. L. Brown, W. G. Browne, P. V. Davies, E. W. Dawson, L. A. Hooper, W. G. Kenthield, H. D. Staiar, and to be Hon. Lt., B. P. K. Walshe, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Capts. whilst empld. as Capts., Grade (B):—I. W. Allen, and to be Hon. Lt., F. A. Cherry, J. H. Tanton, May 1st.

Lt. E. S. Pearse to be Lt., Grade (B), from (S.O.), April 15th.

Sec. Lt. M. Sheriff, D.C.M., to be actg. Lt. whilst empld. as Lt., Grade (A), from Dec. 2nd, 1918, to April 30th.

Lt. S. Pring to be graded for purposes of pay and allowances as Lt whilst empld. as Lt., Grade (A), May 1st.

Lt. W. J. Hembry to be graded for purposes of pay and allowances as Lt., Grade (B), from Dec. 1st, 1918, to April 30th.

Sec. Lts. to be graded for purposes of pay and allowances as Lts. whilst empld. as Lt., Grade (B):—J. O. Miles, A. Crook, and to be Hon. Lt., W. G. Shipwright, J. Dale, W. F. Arnold, A. E. Wycherley, May 1st.

Sec. Lt. J. H. Lester to be Lt., without pay and allowances of that rank, April 18th.

Sec. Lt. R. A. Bell to be Sec. Lt., Grade (A), from Grade (B), March 7th.

Sec. Lt. H. P. Bolt to be Sec. Lt., Grade (A), from (Ad.), May 7th.

Sec. Lt. R. S. Davey to be Sec. Lt., Grade (B), from (A), Jan. 16th.

Sec. Lts. (Ad.) to be Lts., Grade (B):—(Hon. Lt.) U. B. Gilbert, and to be Hon. Lt., Oct. 1st, 1918; B. H. W. Hatch, May 12th.

Sec. Lt. R. R. Wilson (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt., June 24th, 1918.

Transferred to unempld. list:—Sec. Lt. (Hon. Lt.) J. J. Martin, Feb 12th; Lt. (actg. Capt.) J. Wingate, Feb. 25th; Sec. Lt. J. Wilson, Feb. 28th; Sec. Lt. (actg. Lt.) G. R. Eaton, Capt. W. Young, March 31st; Sec. Lt. J. L. Cleland, April 1st; Sec. Lt. E. Long, April 11th; Sec. Lt. E. A. O. Hobby-Hamm, April 13th; Lt. (Hon. Lt.) Hardy, April 14th; Lt. (Hon. Capt.) F. L. Royle (K.O.Y.L.I.), April 15th; Lt. (actg. Capt.) A. E. Fisher, Lt. (actg. Capt.) G. C. Heseltine, April 15th; Capt N. H. Terry, April 17th; Sec. Lt. F. Robins, April 21st, Sec. Lt. (Hon. Lt.) P. E. Harris, April 21st; Lt. A. A. Davis, May 1st; Lt. A. Gane, May 2nd; Sec. Lt. (actg. Lt.) R. C. Edmand, May 3rd; Sec. Lt. T. L. Collins, Sec. Lt. (actg. Lt.) W. G. Mantell, May 5th; Sec. Lt. (Hon. Lt.) L. C. Coward, Capt. A. Eve (T.F. Rec.), May 6th; Lt. H. L. Craymer, Capt S. L. Dashwood, M.B.E., May 7th; Lt. F. W. Atkinson, May 8th; Capt. A. C. S. Couldwell, May 10th; Sec. Lt. L. Knowles, May 11th; Sec. Lt. G. Betts, Capt. L. C. Cox, May 12th; Lt. W. P. Precth, Sec. Lt. B. De B. Gates, Capt. A. B. W. Greenhough, M.B.E., M.C., Sec. Lt. R. Hagon, Lt. D. B. Wilson, M.C. (R. Scots), May 13th; Sec. Lt. (Hon. Lt.) (actg. Capt.) C. H. Blakeway, Capt. (actg. Maj.) J. H. Cotton, Capt. (actg. Maj.) L. Crooks, Maj. (actg. Lt.-Col.) M. O. Darby, Capt (actg. Maj.) H. G. Day, May 14th; Sec. Lt. A. Green, Lt. H. Hamilton, Sec. Lt. H. Hennan, Capt L. A. Hoy, May 15th; Capt. W. A. Morrison, May 16th; Sec. Lt. I. D. Bennett, Sec. Lt. R. G. Gould (Devon R.), May 20th.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—H. T. Hickey (contracted on active service), May 17th, C. H. MacKinnon, May 20th.

The notification in "Gazette," Jan. 7th, concerning Lt. (actg. Capt.) J. Wingate is cancelled.

The notification in "Gazette," March 18th, concerning Capt. W. E. Smith is cancelled.

Medical Branch.—H. A. Treadgold is granted a temp. commn. as Capt. and to be temp. Maj. without pay and allowances of that rank, Sept. 2nd, 1918, seny. April 1st, 1918 (substituted for notification in "Gazette." Sept. 24th, 1918).

Capt. A. G. Graham is antedated in his appointment to July 1st, 1918.

Transferred to unempld list.—Capt. J. E. Cable, May 8th; Capt. C. K. Attlee, May 11th; Capt. D. A. MacPherson, May 18th.

Chaplain's Branch.—Transferred to the unempld. list:—Capt. W. H. B. Gipps, May 9th; Capt. W. Galrin, May 18th.

Memoranda.—The following are granted the actg. rank stated against their names, with effect from May 1st:—

To be actg. Lt.-Cols.:—Lt.-Col. A. D. Cunningham, while empld. in the Airships Department, Admiralty; Lt.-Col. B. H. O. Armstrong, C.M.G., while empld. as Director of Inland Works; Lt.-Col. T. D. Mackie, C.M.G., O.B.E., while empld. as Director of Air Construction Service.

To be actg. Lt.-Cols.:—Maj. A. V. J. Richardson (substituted for the notice in "Gazette," May 20th); Maj. S. B. F. Carter, O.B.E., while empld. as Assistant Director of Air Construction Service; Maj. J. G. Bayes, O.B.E., while empld. as Area Officer in the Depart. of A.C.S.; Maj. W. J. Fernie, O.B.E., while empld. as Area Officer in the Depart. of A.C.S.; Maj. J. D. K. Kestler, while empld. as Chief Elec. Engineer in the Depart. of A.C.S.; Maj. C. Barber, while comdg. a Stores Depôt; Maj. R. Grey, while specially empld.; Maj. L. Tomkinson, while specially empld.; Capt. G. W. Parkinson, M.C., while empld. as Assistant Director of Inland Works; Capt. C. Cookson, while empld. as Assistant Director of Inland Construction; Capt. W. Farthing, O.B.E., while empld. as Area Officer in the Depart. of A.C.S.; Capt. L. B. Cook, while empld. as Area Officer in the Depart. of A.C.S.; Capt. O. Lindquist, while comdg. a Stores Depôt.

To be actg. Majs.:—Capt. R. A. Laws, while specially empld. with the Depart. of A.W.B.; Capt. J. C. Watson, while specially empld. with the Depart. of A.W.B.; Capt. D. Goad, while empld. as Senior Elec. Officer in the Depart. of A.C.S.; Capt. A. Young, while comdg. a Stores Depôt; Capt. J. R. Harland, while empld. as Officer i/c of Maintenance in the Dept. of A.C.S.; Capt. E. F. W. Cherry, while empld. as Officer i/c of Stores in the Dept. of A.C.S.; Capt. J. P. Coleman, A.F.C., while specially empld; Capt. P. G. N. Ommanney, while empld. in the Airship Dept., Admiralty; Capt. J. E. M. Pritchard, while empld in the Airship Dept., Admiralty; Capt. A. Price-Reed, while empld. in the Airship Dept., Admiralty; Capt. G. Somers-Clarke, while specially empld.; Capt. F. L. Kohinson, C.B., while specially empld.; Capt. C. K. Carr, while specially empld.; Capt. S. W. Dawson, while specially empld.; Capt. F. S. Mohler, M.C., while specially empld.; Capt. G. L. Paine, while specially empld.; Lt. A. W. Legg, while specially empld. as Chief Water Engineer with the Depart. of A.W.B.; Lt. H. S. Watson, while empld. as Deputy Chief Elec. Engineer with the Dept. of A.W.B.; Capt. H. R. B. Hull.

To be actg. Hon. Majs.:—Capt. G. W. C. Kaye, while specially empld.; Capt. H. Myers, while specially empld.

To be actg. Capts.:—Lt. F. M. F. West, V.C., M.C., while empld. as Liaison Officer for Air Intelligence; Lt. F. Edwards, while empld. in the Airship Depart. of A.C.S.; Lt. C. Kendall, M.C., while empld. as Officer)/c of R.A.F., Repatriation Records; Lt. G. N. Trace, while specially empld.; Lt. A. D. Carey, while specially empld.; Lt. F. Lord, while specially empld.; Lt. W. R. S. Humphreys, while specially empld.; Lt. B. R. Bostock, while specially empld.; Lt. E. Brown, while specially empld.; Lt. A. Cantrill, while specially empld.; Lt. E. Burney, M.C., while specially empld.; Lt. W. C. Smith, while specially empld.; Lt. W. B. Thomson, while specially empld.; Lt. F. V. Robinson, while specially empld.; Sec. Lt. J. W. Tattersall, while specially empld.; Sec. Lt. D. MacDougall, while specially empld.; Sec. Lt. N. Bucknall, while specially empld.; Sec. Lt. W. Borland, while specially empld.

To be actg. Lts.:—Lt. C. Lumb, while empld. in the Airship Dept., Admiralty; Sec. Lt. W. A. Fowler, while empld. as Group Educational Officer; Sec. Lt. M. Sheriff, D.C.M.

The following are granted the hon. rank of Capt.:—Lt. J. B. Runciman, June 11th, 1918; Lt. J. G. Halsam, Nov. 9th, 1918; Sec. Lt. (actg. Capt.) G. H. Hill, March 31st.

The following Overseas Cadets are granted temp. commns. as Sec. Lts.:—863088 R. Ardiel, 172727 E. D. Bate, 171604 O. E. Byers, 172852 F. Bullock, 200811 A. E. Beck, 184499 J. Christie, 316307 E. H. Cuckow, 316270 W. H. Campbell, 171473 J. S. Cape, 171104 M. Connell, 24118 W. E. Cooper, 38055 E. L. Costello, 316582 D. L. Chambers, 778459 G. Cooperthwaite, 754144 W. A. Chisholm, 316323 E. J. Diespecker, 316233 C. F. Dioron, 171302 J. H. Dietrich, 172690 C. L. Dowsley, 316285 J. H. Donelly, 316375 J. W. Donald, 1030769 F. L. Dunn, 172542 W. C. Delapp, 222053 J. C. Demars, 172466 F. Dorien, 154850 H. H. Dolmage, 154762 R. R. De Long, 316386 R. L. Emprey, 316354 R. H. Elgie, 1703829 R. M. Edgar, 259166 N. F. Evans, 316394 E. E. Fairburn, 316039 S. Field, 316291 L. G. Foss, 1977 M. S. Fellowes, 92726 E. A. Fergusson, 316370 F. B. Friend, 316030 J. M. Fraser, 213000 N. H. Grills, 316220 T. D. Guernsey, 706071 J. A. Green, 690063 G. N. Goodman, 513494 A. G. Green, 301767 A. Gillespie, M2/153348 E. H. Hanbury, 1720057 D. Hannerson, 727382 J. T. Hockey, 221276 C. Heffernan, 316288 C. Horner, 171330 S. Hall, 172729 F. Hudson, 487363 A. F. Huff, 184101 N. W. S. Hunter, 15345 S. T. Harvey, 316234 W. L. Hastings, 75112 S. Honeyman, SS 5386 B. S. W. Holden, 57020 R. Hulland, 542174 T. F. Holtz, 316222 H. Haywood, 316254 J. A. Johnson, 171781 R. Johnson, 1258006 L. B. Keating, 172859 A. E. Kerr, 154230 J. G. Kelly, 33558 R. H. Kelly, 182249 J. Killin, 316130 D. J. Ludgate, 502497 A. E. Long, 184528 J. Love, 316253 J. G. Loynes, 316245 R. G. Laing, 8860 C. D. Law, 76913 G. V. Lowie, 266 S. G. Lorraine, 316298 P. A. McCandless, 316299 R. M. McLenaghen, 172751 D. Moir, 171474 W. F. Morrin, 171034 W. S. McKeown, 172717 R. A. McNaught, 487566 H. Moore, 907277 H. K. Mason, 316250 D. A. McKeague, 542299 W. S. McCutcheon, 504910 J. Menagers, 251151 R. E. Mould, 487413 L. L. Moore, 76439 D. Morrison, 316241 J. H. H. McDonald, 316271 C. G. A. Marple, 153977 S. A. McLean, M/119554 C. W. Manning, 525562 G. B. Nedlands, 171557 J. H. O'Connor, 171457 G. F. Penny, 316290 C. W. Perrett, 172872 J. M. Peine, 172289 P. J. Potter, 184713 C. Portsmouth, 316396 G. F. Plumb, 512112 R. S. Pidcock, 316315 A. Rae, 186135 W. J. A. W. Roulston, 171976 J. G. Robertson, 172382 R. W. Ross, 316234 A. H. Roy, 171587 J. Robinson, 316305 A. M. Russell, 316248 S. F. Roe, 5402254 W. H. Russell, 316304 W. A. Smith, 171850, A. St. Jeans, 316305 W. H. Stanton, 316315 H. C. Startup, 172138 G. E. Summner, 182121 A. A. Smith, 172132 D. Smith, 171036 C. Stevens, 303420 C. W. Scott, 171028 G. L. Stevens, 667 G. K. Spruitt, 154217 D. H. Stewart, 171241 O. C. Sturdy, 339356 F. G. Solloway, 1261748 C. L. Shields, 171035 C. N. Stevens, 343420 C. W. Scott, 316786 H. R. Thornton, 172811 J. M. Tate, 171927 B. Tompkins, 166338 J. C. Thompson, 2101332 J. V. Thompson, 118234 H. J. Wilson, 316868 L. B. West, 316296 H. Wright, 154220 A. L. Wheeler, 316366 A. E. Walker, 316325 L. B. Weldon, 316162 W. C. H. Webb, 316229 E. J. Wain, 171545 V. B. Whitley, 183357 H. W. Whistler, 895270 D. S. Wylie, 154790 E. C. S. Wintcimute, Feb. 15th.

Col. W. B. Caddell relinquishes his commn. on ceasing to be empld., and is granted the hon. rank of Brig.-Gen., May 28th.

Transferred to unempld. list:—Lt.-Col. G. Waddell, from (S.O.) March 28th; Sec. Lt. (Hon. Lt.) (actg. Capt.) E. Yevers, from (S.O.), March 31st; Lt. (actg. Maj.) D. L. Blumenfield, from (S.O.), April 1st.

Capt. (actg. Maj.) W. T. Blake (Oxon and Bucks. L.I.) relinquishes his commn. on account of ill-health, May 13th.

AIR MINISTRY, May 30th.

R.A.F.—The following temp. appointments are made at the Air Ministry:—Staff Officers, 1st Class (P.).—Lt.-Col. E. I. T. Courtney, Lt.-Col. K. G. Brooke, from (Director), May 1st.

Staff Officers, 2nd Class (Air).—Lt.-Col. E. L. Gossage, M.C., Capt. R. R. Maycock, O.B.E., Maj. O. G. G. Villiers, D.S.O. (P.).—Maj. A. H. S. Steele-Perkins, O.B.E., from (S.O., 1st Class, May 1st.

Staff Officers, 3rd Class (Air).—Capt. E. O'D. Crean, Lt. A. Rowan, Lt. R. Gambier-Parry. (P.).—Capt. C. G. Murray, May 1st.

Staff Officers, 4th Class (P.).—Lt. A. W. Symington, M.C., Lt. E. N. T. Edwardes, May 1st.

The following temp. appointments are made:—Staff Officer, 2nd Class (P.).—Maj. R. Hilton-Jones, O.B.E., May 23rd.

Administrative.—Capt. E. H. T. Atkinson to be actg. Maj. whilst so empld., from April 19th, 1918, to May 21st.

Staff Officers, 3rd Class (Q.).—Lt. T. T. Pickup, and to be actg. Capt. whilst so empld. till April 30th, vice Capt. H. R. Radford, April 24th. (T.).—Sec. Lt. H. F. Webb, and to be actg. Capt., from Feb. 18th to April 30th.

FLYING BRANCH.—Maj. J. C. P. Wood to be Maj. (A. and S.), from unempld. list, May 6th, seny. April 1st, 1918, next below B. Travers.

Capt. (actg. Maj.) R. F. N. Gerrard, D.S.C., to be Capt. (A. and S.), and relinquishes the actg. rank of Maj., April 22nd.

Sec. Lt. V. O. Hillyard to be Lt., June 25th, 1918.

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. (Hon. Lt.) L. A. Naylor (Lt., Nova Scotia R.), Dec. 29th, 1918; Lt. (actg. Capt.) D. J. Nickle (Capt., Can. Forestry C.), Jan. 12th; Lt. J. Grimshaw (Lt., Manitoba R.), Jan. 30th; Sec. Lt. R. M. Close (Sec. Lt., Notts and Derby R.), Feb. 3rd; Sec. Lt. (Hon. Capt.) W. G. Shedel (Lt., R. Fusiliers), Feb. 27th; Lt. A. B. Raymond (Capt., Can. A.S.C.), March 5th; Sec. Lt. (Hon. Lt.) E. A. Johnson (Lt., C. Ontario R.), March 9th; Lt. C. C. R. Millington (Sec. Lt., R.G.A.), March 21st; Sec. Lt. (Hon. Lt.) T. J. D. Reid (Lt., and B. Horse Yeo.), April 1st; Lt. H. D'A. Mc-Carthy, Sec. Lt. C. Hess, April 10th; Sec. Lt. (Hon. Lt.) L. C. Herne (Lt., B. Col. R.), April 16th; Sec. Lt. (Hon. Lt.) E. C. Clegg, M.C. (Lt., Wilt. R.), May 5th; Lt. C. E. Rendall (Lt., R.F.A.), May 9th, Lt. W. A. Ross (Lt., Sask. R.), May 8th; Sec. Lt. A. G. L. Sidwell (Lt., R. Dub. Fus.), May 11th; Lt. H. B. Morkhill (Lt., Yorks R.), May 18th; Lt. A. G. Lough (Lt., Cent. Ont. R.), May 26th; Lt. L. A. Newbold (Lt., Essex R.), May 22nd; Maj. G. D. Hill (Capt., Hussars), May 26th.

Transferred to unempld. list:—Sec. Lt. D. Jones, Jan. 7th; Sec. Lt. F. P. Regan, Jan. 27th; Sec. Lt. F. E. Power, Jan. 30th; Lt.-Col. (actg. Col.) R. R. Smith-Barry, A.F.C., Feb. 4th; Lt. G. W. S. Marshall, Feb. 14th; Lt. H. W. Skinner, D.F.C., Feb. 15th; Lt. R. A. Barnard, Feb. 22nd; Lt. W. R. W. Burns, Lt. W. P. Scott, Feb. 27th; Lt. F. J. Delamain, Feb. 28th; Sec. Lt. M. G. Church, March 1st; Sec. Lt. C. G. Davies, Lt. P. Robinson, March 6th; Sec. Lt. W. Du Pre Jr., Arthur, Sec. Lt. T. C. Cooper (substituted for notification in "Gazette," March 18th); Lt. C. D. Clarke, March 7th; Lt. R. A. Evans, Sec. Lt. P. G. Troughton, March 8th; Sec. Lt. H. Rose, D.F.C., Sec. Lt. G. E. Cliffe, March 9th; Z. Conan, Sec. Lt. C. Hess, March 15th; Sec. Lt. A. A. Baker, Sec. Lt. C. A. Howe, March 25th; Lt. A. D. Pocock, March 28th; Sec. Lt. L. P. Boulder, March 31st; Sec. Lt. N. Barrie, Lt. J. I. Beddingfield, Sec. Lt. J. F. Stone, Lt. (actg. Capt.) L. Wood, April 1st; Lt. (actg. Capt.) V. D. Siddons, D.F.C., April 3rd; Lt. (actg. Capt.) R. T. Pearce, D.F.C., Sec. Lt. F. J. Smith, April 4th; Sec. Lt. K. C. Whitwell, April 5th; Capt. (actg. Maj.) F. J. E. Feeney, D.S.O., April 6th; Sec. Lt. (Hon. Lt.) F. Godson, D.F.C., Lt. J. K. Hardy, Lt. H. Sacre, Lt. J. G. Stevenson, April 8th; Lt. A. C. Dent (Norfolk Yeo.), Sec. Lt. B. Stewart, Capt. E. B. Waller, Lt. R. Whitehead, Sec. Lt. H. Woodcock, Sec. Lt. F. H. Snoxell, Sec. Lt. C. Steel, April 9th; Sec. Lt. W. Johnson, April 10th; Sec. Lt. G. F. Gander, Sec. Lt. S. E. Grand, Capt. E. Pownall, Sec. Lt. A. Paveley, Lt. (actg. Capt.) C. A. F. Whitley, April 11th; Lt. K. W. D. Pope, Lt. L. E. Swann, April 12th; Lt. L. A. Fanning, Lt. V. O. Hazeldine, Sec. Lt. W. Hall, Sec. Lt. M. J. Poulton, Sec. Lt. F. E. Power, Sec. Lt. J. M. Portcous, Sec. Lt. A. B. Porter, April 13th; Lt. H. Gerrard, D.F.C., Sec. Lt. H. Scrivener, Sec. Lt. J. L. Stephenson, Sec. Lt. (Hon. Lt.) E. M. C. Shipp, April 14th; Sec. Lt. E. R. Heartz, Lt. S. C. M. Pontin, Sec. Lt. H. T. Sayer, Sec. Lt. F. W. Skelton, Lt. O. St. J. Swan, Lt. (actg. Capt.) A. W. Welsh, Sec. Lt. R. L. Williams, April 15th; Lt. B. W. Robinson, April 16th; Lt. L. D. Henderson, Lt. A. W. B. Singer, Sec. Rif., Lt. J. Scott, Lt. E. G. Welsby, Sec. Lt. Dilkes, Lt. A. R. Wilkie, April 17th; Lt. H. E. Pohlmann, Sec. Lt. D. Welsh, Lt. H. A. Yeo, April 18th; Lt. R. C. Berlyn, Sec. Lt. W. T. Booth, Sec. Lt. G. G. Dow, Lt. B. N. Durrant, Sec. Lt. R. H. Galloway, Sec. Lt. H. H. Hewetson, Sec. Lt. S. E. Henry, Sec. Lt. A. B. Macpherson, Sec. Lt. H. S. McClelland, Sec. Lt. F. N. B. Proctor, Sec. Lt. S. D. Spalding, Lt. H. W. H. Wade, Sec. Lt. A. Wright, April 19th; Capt. R. H. Pollock, M.C., R.F.A., Sec. Lt. J. S. Shortt, Lt. G. W. Wall, April 20th; Sec. Lt. (Hon. Capt.) G. D. Brewster, M.C., Lt. W. H. Statham (Leic. R.), April 21st; Sec. Lt. S. T. Franks, Sec. Lt. H. A. Raymond, Lt. F. D. Shreeve, April 24th; Sec. Lt. A. Dukes, Lt. H. E. Eaton, Lt. J. R. Hembrough, April 25th; Capt. S. Collier, M.C. (Ches. R., T.F.), Lt. A. Wardle, April 26th; Sec. Lt. A. Worrall, April 27th; Lt. W. W. Heywood, April 28th; Sec. Lt. R. W. Williss, Sec. Lt. K. Wiggins, April 29th; Lt. I. R. L. Ross (R. Ir. Rif.), Sec. Lt. F. G. Sinclair, Lt. (actg. Capt.) B. R. Vertannes, Sec. Lt. F. C. Wells, Lt. (actg. Capt.) R. G. Weller, April 30th; Capt. E. E. Maitland-Heriot, Sec. Lt. J. Simpson, May 1st; Sec. Lt. P. G. Addie, Lt. A. Sandy, Sec. Lt. (Hon. Lt.) J. H. T. Townsend, Sec. Lt. G. E. Wright, May 2nd; Sec. Lt. (Hon. Lt.) A. K. Sadler, May 3rd; Lt. W. H. Barlow, Capt. I. H. Stockwood, May 4th; Sec. Lt. L. Sabine, May 5th; Sec. Lt. G. E. Bates, Sec. Lt. R. K. Dickie, Lt. E. G. Henderson, Sec. Lt. M. Rock, Sec. Lt. G. E. Richmond, Lt. R. S. Warwick, May 6th; Sec. Lt. C. H. Ratcliffe, Lt. T. H. Trew, May 7th; Sec. Lt. W. Brown, Sec. Lt. J. B. Coll, May, Sec. Lt. A. C. Dutton (R. W. Kent R.), Sec. Lt. A. J. Girardot, Lt. E. E. Macartney, May 8th; Sec. Lt. M. O. I. Griffiths (Suff. R.), Sec. Lt. J. S. Winks, May 9th; Sec. Lt. A. J. McD. Grimston, Sec. Lt. R. E. Morton, May 10th; Sec. Lt. L. T. Bird, Sec. Lt. R. T. Down, Sec. Lt. R. R. Spencer, Lt. F. E. J. Foxall-Smedley, May 12th; Lt. G. G. Allander, Sec. Lt. A. N. Dilliway, Lt. W. Pallister, May 13th; Sec. Lt. H. Blatcher, Capt. D. B. Cleghorn, Sec. Lt. J. H. Parkinson, Sec. Lt. A. Preston, Sec. Lt. S. F. Wilkin, May 14th; Lt. S. P. A. Bousfield (Sea. Highrs.), Sec. Lt. C. McIver-Campbell, Lt. H. V. Edwards, May 15th; Sec. Lt. E. N. Andrews, Capt. A. R. Cox, Sec. Lt. F. H. Fisher, Sec. Lt. S. Meadows, Sec. Lt. L. B. Williams, May 16th; Sec. Lt. H. W. Argyle, Sec. Lt. A. Bell, Lt. (Hon. Lt.) J. H. MacKellar, Sec. Lt. G. R. Mc-Arthur, Lt. S. L. Matthews, Maj. J. J. Powell, M.C., May 17th; Sec. Lt. G. S. Overend, Sec. Lt. A. Phipps, May 18th; Sec. Lt. C. E. Belanger, Lt. R. S. Greig, Lt. F. J. Ortweiller, Sec. Lt. H. K. Pople, M.C., May 19th; Sec. Lt. H. A. Bradshaw, Sec. Lt. J. M. Brett, Lt. G. W. J. G. J. Dunn, Lt. W. E. Thumbtil, Sec. Lt. R. D. Dewar, Lt. L. C. Diespecker, A.F.C., R.F.A., Sec. Lt. L. Dotzert, Sec. Lt. F. R. Dunn, Sec. Lt. J. R. Fourmier, Sec. Lt. A. R. M. Gunning, Sec. Lt. E. Hemsby, Sec. Lt. V. P. Murphy, Sec. Lt. J. L. Machon, Sec. Lt. F. Michols, Sec. Lt. R. Nicklin, Sec. Lt. C. E. O'Grady, Sec. Lt. V. O'Neill, Sec. Lt. W. Penhall, Sec. Lt. T. B. Tatterson, Lt. C. St. C. Parsons, Sec. Lt. A. W. Palmer, Capt. J. Robinson, D.F.C., Sec. Lt. H. F. Sullivan, Sec. Lt. W. Spittal, Sec. Lt. C. Seymour, May 20th; Sec. Lt. A. S. Ball, Sec. Lt. V. A. Brabant, Sec. Lt. P. S. Brown, Sec. Lt. C. H. Main, Lt. F. G. Pool, May 22nd; Sec. Lt. E. E. Dajoe, Sec. Lt. J. C. Deremo, Sec. Lt. L. P. J. Dion, Lt. J. G. Farquhar, Lt. F. P. Gifford, Maj. V. Nicholl, D.S.O., May 23rd; Lt. L. G. Candy, May 26th; Sec. Lt. J. W. Meltam, May 28th; Lt. C. L. Frank, Sec. Lt. J. W. Gravell, Sec. Lt. W. G. Millar, May 29th.

Lt. (actg. Capt.) H. E. Winter relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Capt., May 21st.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—C. Packham, May 14th; J. F.

Drake, D.F.C., E. N. A. Kennington, R. F. Round, May 20th; J. H. McClure (caused by wounds), May 21st.

Lt. J. R. MacMillan (Sask. R.) relinquishes his commn. on account of ill-health, April 9th.

Lt. H. J. Leavitt resigns his commn., May 31st.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—J. Duncan, J. W. Marshall (contracted on active service), H. B. Mills, May 20th.

R. W. Rollinson (contracted on active service), May 21st.

Sec. Lt. A. Graham to take rank and prec. as if his appt. as Sec. Lt. bore date Aug. 22nd, 1918.

Sec. Lt. W. Smith (commd. March 14th, 1918) is cashiered by sentence of a General Court Martial, March 12th.

Sec. Lt. G. J. N. Norman is dismissed the Service by sentence of a General Court Martial, April 14th.

The rank of Lt. J. M. Bacon is as now described, and not as stated in "Gazette," April 1st.

The initials of Lt. C. H. Clifford are as now described, and not G. H., as stated in "Gazette," May 2nd.

The surname of Lt.-Col. G. C. St. P. De Dombasle is as now described, and not as stated in "Gazette," May 16th.

The initials of Lt. C. S. L. Coulson, D.F.C., are as now described, and not as stated in "Gazette," April 15th.

The notification in "Gazette," March 18th, concerning Lt. E. T. Collins, is cancelled.

The notification in "Gazette," March 25th, concerning Sec. Lt. A. J. Gilles, is cancelled.

The notification in "Gazette," April 1st, concerning Lt. B. N. Willis, is cancelled.

The notification in "Gazette," April 4th, concerning Sec. Lt. N. V. Scott (S. Staffs. R.), is cancelled.

The notification in "Gazette," April 8th, concerning Lt. J. F. Drake, is cancelled.

The notification in "Gazette," April 25th, concerning Lt. W. G. Roberts, is cancelled.

The notification in "Gazette," April 29th, concerning Lt. R. A. Burnand, M.C., is cancelled.

ADMINISTRATIVE BRANCH.—H. C. Jones (Capt., Middx R.) is granted a temp. commn. as Capt., Sept. 12th, 1918, with seny. from April 1st, 1918.

To be actg. Capts. whilst empld. as Capts. :—Lt. W. H. D. Phillips, from Feb. 27th to April 30th; Sec. Lt. E. U. Poyser, from March 1st to April 3rd.

Lts. to be graded for purposes of pay and allowances as Capts. whilst empld. as Capts. :—J. M. J. C. J. I. Rock, W. H. D. Phillips, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances of Capts. whilst empld. as Capts. :—H. Baker, E. G. Burden, E. Codyre, and to be Hon. Capt., J. N. Dillon, F. T. Dixon, W. A. Glasper, A. E. H. Hales, A. H. Hasler, R. W. Johnson, G. A. McMillan, and to be Hon. Lt. J. H. Slingsby, G. E. L. Woodhouse, and to be Hon. Lt., May 1st.

Sec. Lt. L. Marquard to be graded for purposes of pay and allowances of Capt. whilst empld. as Educational Officer, May 1st.

Sec. Lts. to be graded for purposes of pay and allowances as Capts. whilst empld. as P.T. Officers :—G. P. Abbott, A. J. Adams, S. D. Harrower, P. W. Smith, C. Wilson, and to be Hon. Lt., May 1st.

Lts. (A.) to be Lts. :—N. S. Cameron, C. S. L. Coulson, D.F.C., D. P. Farley, K. L. Mackenzie, April 17th; G. F. Hunter, J. M. Johnson, May 6th; F. W. Dogherty, May 10th; J. E. W. Sugden, May 12th; L. Mortimore, May 13th.

Lts. (O.) to be Lts. :—C. Flavell, April 17th; F. J. B. Hammersley, May 7th.

Sec. Lts. to be Lts. :—(Hon. Lt.) E. L. Ridley, May 29th; H. T. Joy, Feb. 28th (substituted for notification in "Gazette," April 25th); L. M. Britten, April 23rd.

T. T. Coates (Capt. and Qr.-Mr., Spec. List) is granted a temp. commn. as Lt., April 1st, 1918, and to be Hon. Capt.

Sec. Lt. F. H. H. Twelvetree to be actg. Lt. whilst empld. as Lt., from (T.) from Sept. 26th, 1918, to April 30th.

Sec. Lts. to be Sec. Lts., from (T.) :—(Hon. Lt.) J. F. Alexander, May 1st, and to be graded for purposes of pay and allowances as Capt. whilst empld. as Capt. :—A. T. Robson, May 13th.

The following relinquish their commns. on ceasing to be empld. :—Lt. W. S. Hann (Lt., R. Horse Gds.), March 24th; Lt. (actg. Capt.) P. J. Gething, M.C. (Lt., R. War. R.), May 20th.

Transferred to unempld. list :—Lt. (actg. Capt.) C. F. Upton, Feb. 8th (substituted for notification in "Gazette," April 1st); Capt. (actg. Maj.) C. J. Page, Feb. 10th; Sec. Lt. J. P. Wotton, March 4th; Sec. Lt. D. J. Tarling, March 5th; Lt. R. E. Coppinger, March 15th; Sec. Lt. M. R. de Saxe, April 10th; Sec. Lt. (Hon. Lt.) (actg. Lt.) C. Kenyon, Sec. Lt. A. C. Schofield, Sec. Lt. W. H. Stanley, Lt. B. Strange (Linc. Yeo., T.F.), April 11th; Lt. G. A. Pocock, Lt. E. Waters, April 12th; Sec. Lt. S. A. Garfath, April 14th; Sec. Lt. M. J. Hemmer, Sec. Lt. (actg. Lt.) S. S. Vanderhook, Lt. N. C. Yonge, April 16th; Capt. H. A. Shinn, April 18th; Lt. J. H. Pollitt, April 25th; Sec. Lt. (Hon. Lt.) (actg. Lt.) H. L. Webley, April 28th; Capt. C. W. Pollock, April 29th; Sec. Lt. (actg. Lt.) F. R. Whittaker, April 30th; Lt. J. E. Rosselli, Lt. (Hon. Capt.) W. H. Kelley, May 1st; Sec. Lt. D. Beaumont, Sec. Lt. F. W. Gibbs, May 4th; Lt. W. H. Savery, May 7th; Sec. Lt. G. R. Dunworth, Sec. Lt. H. F. Green (R. Fus.), May 8th; Sec. Lt. L. H. Seccombe, May 10th; Lt. A. R. Porter, Capt. H. V. Robinson, May 13th; Lt. H. G. Burgess, May 14th; Capt. J. A. Gye, Sec. Lt. A. P. Steer, May 17th; Capt. E. F. Monk, Sec. Lt. W. C. Marshall, May 18th; Sec. Lt. T. B. McMillan, Sec. Lt. H. H. Newman, Lt. A. P. Prior, May 20th; Lt. L. H. B. Price, M.C., May 21st; Lt. G. R. Priestley, May 24th; Sec. Lt. W. G. Merrick, Lt. A. T. Packman, Lt. J. L. Probit, May 29th.

The notification in "Gazette," April 8th, concerning Lt. C. A. Howe, is cancelled.

The notifications in "Gazette," May 2nd, concerning the undermentioned officers are cancelled :—Lt. C. H. Clifford, Capt. (actg. Maj.) H. W. Morgan, Lt. (actg. Capt.) B. Turner, Lt. H. B. Turner

TECHNICAL BRANCH.—To be actg. Majs. while empld. as Majs., Grade (A) :—Capt. W. H. Dolphin, from March 11th to April 30th; Lt. (actg. Capt.) F. Susans, from Nov. 26th, 1918, to April 30th

Lt. (actg. Capt.) B. Turner retains the actg. rank of Capt. whilst empld. as Chemical Warfare and Explosives Expl. Officer from March 29th to April 30th.

Sec. Lt. (actg. Capt.) J. H. Lytle retains his actg. rank whilst empld. as Capt., Grade (B), from (Ad.), from Nov. 9th, 1918, to April 30th.

Lt. C. F. Blunt to be actg. Capt. whilst empld. as Capt., Grade (A), from Dec. 17th, 1918, to April 30th.

Lt. J. A. Atkinson to be actg. Capt. whilst empld. as Capt., Grade (B), from June 1st, 1918, to April 30th.

Sec. Lt. J. A. Atkinson to be actg. Capt. whilst empld. as Capt., Grade (A), from Dec. 10th, 1918, to April 30th.

Sec. Lt. J. A. F. Henderson to be actg. Capt. whilst empld. as Capt., Grade (B), from (Ad.), from May 30th, 1918, to April 30th (substituted for notification in "Gazette," Aug. 30th, 1918.

Lt. H. A. Adams to be Lt., Grade (B), from (S.O.), May 12th.

Sec. Lts. to be Lts. :—Hon. Capt. H. M. Eldridge, M.C., and to retain his hon. rank, Nov. 1st, 1918 (substituted for notification in "Gazette," March 7th; L. A. Owen, April 2nd.

A. Hunnings (temp. Lt., K.R.R.C.) is granted a temp. commn. as Sec. Lt., Grade (A), April 1st, 1918, and to be Hon. Lt.

Lt. E. H. Wilson (Lt., Notts and Derby R.) relinquishes his commn. on ceasing to be empld., April 10th.

Transferred to unempld. list :—Capt. A. Lord Kennedy, Feb. 4th; Sec. Lt. G. R. Wills, Feb. 8th; Lt. J. A. H. O'Hynes, Feb. 13th; Capt. H. S. Smith, Feb. 13th; Capt. W. A. Seed, March 6th; Maj. K. Secratan, March 30th; Capt. J. E. Haswell, April 1st; Sec. Lt. F. S. Wallis, April 2nd; Sec. Lt. (Hon.) (actg. Lt.) E. L. Pollard, M.C., April 4th; Lt. L. D. Brown, April 8th; Capt. T. M. Dutton, April 9th; Lt. R. A. Webster, April 12th; Sec. Lt. H. Powell, April 15th; Sec. Lt. B. Haynes, Sec. Lt. J. J. Wilson, April 16th; Sec. Lt. A. M. Carroll, Sec. Lt. A. A. Pollitt, April 19th; Lt. (actg. Capt.) H. J. Poole, Lt. S. Power, Sec. Lt. (Hon. Lt.) T. McC. Yarwood, April 22nd; Sec. Lt. (Hon. Lt.) (actg. Capt.) A. Ward, Capt. A. W. F. Smith, April 29th; Lt. A. W. Barlow, April 30th; Lt. F. G. Buck, May 1st; Sec. Lt. A. J. Fright, May 3rd; Sec. Lt. W. W. Brabner, Sec. Lt. C. Henderson, Sec. Lt. P. B. Slade (Lond. R., T.F.), Lt. A. G. D. West, May 6th; Capt. D. S. W. Hambly, May 7th; Lt. S. E. Tucker (Manch. R., T.F.), May 8th; Capt. A. Graves (R.E., T.F.), Capt. G. H. Moir, Sec. Lt. R. A. Silk, May 9th; Sec. Lt. (Hon. Lt.) H. J. Dixon, May 12th; Lt. R. J. Martin, May 13th; Sec. Lt. H. W. Dunk (Lond. Yeo.) Capt. A. F. C. Pollard, May 15th; Lt. J. E. H. Swain, May 16th; Lt. A. Milner, Capt. W. Sillem, May 17th; Sec. Lt. N. Openshaw, May 18th; Capt. C. P. H. Gunyon, May 19th; Sec. Lt. (Hon. Lt.) S. Field, Lt. A. E. Reynolds, May 20th, Sec. Lt. (Hon. Lt.) L. Marsh, May 21st; Capt. T. G. Mallett, May 24th.

Maj. H. R. Vagg to take rank and precedence as if appointment as Maj. bore date Feb. 5th.

The rank of Lt. M. G. Fountain is as now described, and not Sec. Lt. as stated in "Gazette," April 25th.

The notification in "Gazette," Jan. 28th, concerning Sec. Lt. R. Wylie is cancelled.

The notifications in "Gazette," Feb. 11th, concerning the undermentioned Officers are cancelled :—Lt. J. A. Atkinson, Sec. Lt. J. A. Atkinson.

The notification in "Gazette," March 4th, concerning Sec. Lt. G. Colbert is cancelled.

The notification in "Gazette," April 11th, concerning Lt. W. E. Phillips is cancelled.

MEDICAL BRANCH.—Transferred to unempld. list :—Capt. W. B. Dove, Feb. 21st; Capt. C. C. Fitzgerald, M.C. (R.A.M.C.), April 2nd.

MEMORANDA.—The following are granted the actg. rank stated against their names, with effect from May 1st (substituted for notification in "Gazette," May 27th) :—To be actg. Cols. : —Lt.-Col. A. D. Cunningham, while empld. in the Airships Department, Admiralty; Lt.-Col. B. H. O. Armstrong, C.M.G., while empld. as Director of Inland Works; Lt.-Col. T. D. Mackie, C.M.G., O.B.E., while empld as Director of Air Construction Service.

Sec. Lt. (Hon. Lt.) T. Sutherland is granted the hon. rank of Capt., Oct. 20th, 1918.

The following cadets are granted hon. commns. as Sec. Lts. :—390738 R. G. Mitchell, Feb. 15th; 305874 R. A. Bolton, Feb. 17th; 766576 H. Valentine, Feb. 18th; 69/4867 J. Keane, 177018 E. Harris, E. Pridlock, 178688 G. Richards, Feb. 19th; 162 S. L. Gladstone, Feb. 24th, 3813 R. C. Hill, Feb. 25th; 472206 N. S. C. Elmslie, P. J. Woolf, Feb 27th; 128508 A. Bott, 137324 G. W. Dicker, 17581 H. Fenton, 101530 A. F. Hall, 137246 C. M. McLaughlan, 117331 N. Sykes, 13263 J. A. Wilson, March 3rd; R. W. Moyse, 45230 F. R. Weatherhead, March 4th; 177763 E. Birchenough, 165839 A. J. Brown, 177125 T. F. Hodge, 176963 C. Vaughan, March 5th; 176864 W. J. L. Cope, 128436 C. L. M. Stunt, March 6th; 237871 E. C. Cumming 97437 N. Steele, March 10th; 34732 H. G. Hallett, 47232 J. Tullie, 110994 A. G. Tuffield, 811812 G. W. Wallace, March 12th; G/7866 F. C. Clark, 175511 L. E. Edwards, 6016 A. H. Gerrard, 62341 H. J. Gibson, 15162 P. Hamman, 93150 W. C. Hunt, 176402 F. S. Hughes, 176096 W. P. Janes, 175633 E. K. Jarman, 241668 J. W. Kuypers, 111667 C. Law, 21473 W. R. Lewis, 52712 C. A. Mackenzie, 110860 J. L. Mathers, 517010 R. Richings, 117927 R. A. Seaton, 1230 A. R. Whyte, March 13th; 117555 J. Bain, March 15th; P.F.O. C. A. Bax, 175443 W. G. Davies, 8/11574 C. H. St. Parfitt, March 17th; 117651 R. R. Barclay, 221456 C. S. Cronin, 101141 H. A. Cudworth, 137183 W. H. Diggins, 175581 E. E. Ebrall, 217906 H. J. Green, 117979 R. W. Holyfield, 1513 L. R. Morgan, 220777 J. F. Reilly, 225788 R. S. Trebilcock, 137049 A. R. N. Wilkinson, March 18th; 175420 R. J. Asquith, 88625 F. G. Licence, March 19th; 125750 F. A. Barnes, 132621 H. D. Best, 246316 T. H. Boffey, 76774 C. S. Brown, 54766 C. C. Cullen, 202230 W. E. Gregg, 105591 W. Hayes, 41081 A. E. Jepson, M2/679139 D. McInnes, 128307 G. A. A. Robins, March 21st; 304950 E. H. Page, March 22nd; M2/52060 T. W. Edkins, 133621 C. H. Robertson-Green, 195708 W. Smith, March 28th; 137193 F. C. Eckford, 3403 W. Joiner, March 29th; 137748 H. M. Brodie, March 31st; P.F.O. L. J. Barnett, 86677 A. T. Blake, 37601 E. Clark, 117990 H. M. McKeller, 92913 C. C. Wood, April 1st; 324508 C. Causen, 50896 C. Craven, 40021 G. Harris, 117830 E. Thompson, April 2nd; 137161 K. Cheesman, 38920 L. A. Dixon, 7408 W. Frisby, 119194 F. Treville, April 3rd; 176201 G. W. Adams, 55426 W. Barrow, 76737 V. E. Baker, 276079 J. A. Beauchop, 1010056 G. P. Parrett, 402105 G. L. Carper, 36154 N. H. A. Clark, 52554 W. F. Curtis, 137553 Hambourough, 21589 J. Griffiths, 9311 A. J. McWilliams, 405889 H. S. Redhead, 6278 L. F. L. Sammons, 110580 E. R. Spurrier, 100112 M. Stephenson, April 4th; 137162 E. C. Cheesman, April 9th; 76018 A. Bewick, 86898 T. D. Delaney, 133159 G. A. Frenette, 117948 G. Dawe, April 10th; 552503 P. Murphy, May 17th.

Col. (actg. Brig.-Gen.) F. L. Festing, C.M.G., relinquishes his commn. on ceasing to be empld., and is permitted to retain the rank of Brig.-Gen., June 1st.

Transferred to unempld. list :—Lt. C. S. Downey (R.A.O.C.), from S.O., March 28th, Maj. (actg Lt.-Col.) M. Freeman, O.B.E. (Worc. R.), from (S.O.), May 1st; Lt. (actg. Maj) H. Atkins, from (S.O.), May 14th; Sec. Lt. (actg. Capt.) E. E. Page, from (S.O.), May 20th.

The notification in "Gazette," May 13th, concerning Capt. C. W. C. Browne, is cancelled.

The notification in "Gazette," May 16th, concerning Lt.-Col. (actg Brig.-Gen.) C. L. N. Newall, C.M.G., A.M., is cancelled.

ST. JAMES'S PALACE, June 2nd.

The King has been pleased on the occasion of His Majesty's Birthday to approve of the following appointment :—

Capt. His Royal Highness Prince Albert Frederick Arthur George, K.G., Royal Air Force, to be a Personal Aide-de-Camp to the King.

The King has been pleased, on the occasion of His Majesty's Birthday, to give orders for the following appointment to the Most Excellent Order of the British Empire, in recognition of services in connection with the war :—

K.B.E. (MILITARY DIVISION).

Rear-Adm. C. L. Vaughan-Lee, C.B.

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, May 28th

Mr. Harry Hawker and Commander Kenneth Mackenzie-Grieve, R.N., had the honour of being received by the King, when His Majesty decorated them with the Air Force Cross.

BUCKINGHAM PALACE, May 29th.

The following were severally introduced into the presence of His Majesty, when The King invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted :—

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE (MILITARY DIVISION).—COMMANDER.—Col. James Home, R.A.F.

OFFICERS (Military Division)—Lieut.-Col. William Fernie, R.A.F., and Capt. Norman Gilchrist, late R.A.F.

His Majesty then conferred decorations as follows :—

THE MILITARY CROSS.—Capt. George Riley, R.A.F.; Lieut. John Walkerdine, R.A.F.; Second Lieut. Arthur Tearn, N. Staffs. Regt., attd. R.A.F.

BUCKINGHAM PALACE, May 31st.

The King held an investiture in the Quadrangle of the Palace at eleven o'clock this morning.

The following were severally introduced into the presence of The King, when His Majesty invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted :—

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE (Military Division).—Commanders.—Lieut.-Col. Martin Flack, R.A.F., and Lieut.-Col. Harold Moore, R.A.F.

THE DISTINGUISHED SERVICE ORDER AND THE MILITARY CROSS.—Lieut.-Col. Edward Tennant, R.A.F.

The King then conferred decorations as follows :—

BAR TO THE DISTINGUISHED SERVICE CROSS.—Capt. Euan Dickson, R.A.F.

THE DISTINGUISHED SERVICE CROSS.—Capt. Gilbert Nelson, R.A.F.

THE MILITARY CROSS.—Lieut. Charles Robson, R.A.F.

OFFICIAL COMMUNIQUES.

The following communiqué was issued by the India Office on May 28th :—

On May 24th Jelalabad was again effectively bombed, and large portions of the military part of the town are reported to be burnt out.

On May 24th our aeroplanes bombed the powder factory and fort of Kabul. A large explosion was observed.

The India Office states that the following further information has been received from the Government of India :—

Up to May 24th the general situation remained unchanged, and the tribal attitude good.

On the Mohmand border our aeroplanes in this area were fired on by small Afghan guns.

The following communique was issued by the India Office on May 30th :—

During the air raid on Kabul on May 24th bodies of troops, estimated at 5,000 to 6,000 were observed, mostly moving westward, between Gandamak (28 miles south-west of Jalalabad) and Kabul.

The India Office made the following announcement on June 1st :—

The latest information received from Simla, dated May 29th-30th, shows that all the Afghan attacks on our fort at Thal (Kurram Valley) have been repulsed.

An air reconnaissance disclosed 3,000 to 3,500 enemy near Thal. Bombs were dropped on their camps with good effect.

The India Office issued the following on June 2nd :—

The arrival of our aeroplanes at Miramshah, in Waziristan, is reported to have eased the local situation as regards the tribesmen in the neighbourhood.

ADMIRALTY APPOINTMENTS.

The following appointments have been made :—

MAY 27th.—Lieut.—R. J. R. Langmaid, to "Argus."

MAY 31st.—Royal Naval Reserve.—Temp. Lieuts.—L. Beard, to "Empress," May 30th; and S. Myers, to "Benbow," May 29th, and to "Ark Royal," undated.

THE CASUALTY LIST.

AIR FORCE

Reported May 28th.

KILLED.—Cartwright, Lt. J. W. P., R.A.F.
Hayne, Capt. E. T., R.A.F.
Thornhill, Lt. A. G., R.A.F.

DIED OF INJURIES.—Warman, Capt. C. W., D.S.O., M.C., R.A.F.
Norton, Lt. G., R.A.F.

DROWNED.—Evans, Lt. L. L. M., R.A.F.
Stokes, Lt. H. J. E., R.A.F.

PERSONAL NOTICES.

NAVAL.

BIRTHS.

FOWLER.—On May 30th, at Belhurst, Hurstmonceaux, the wife of Major F. B. Fowler, late R.A.F. and Sqdn. Comdr., R.N.A.S.—a daughter.

MARIX.—On May 24th, at Elces, Chigwell, Essex, the wife of Major R. L. Marix, D.S.O., R.A.F. (late Sqd.-Cdr., R.N.A.S.), of a son.

ENGAGEMENT.

FANE—BACON.—The engagement is announced between Captain Gerard Fane, D.S.C., R.A.F., son of Mr. Sidney Fane and Mrs. Fane, and Rhoda, daughter of Mr. and Mrs. Nicholas Bacon, of Raveningham Hall, Norwich.

MILITARY.

DEATHS.

CHISNALL.—Lieut. Charles Alain Chisnall, R.A.F., 21st Canadian Reserve, who died on May 29th at Ripon, was the youngest and only surviving son of Mr. and Mrs. C. H. Chisnall, Frating Abbey, Colchester.

DUNN.—Capt. Frederick Dunn, R.A.F., the pilot of the Tarrant Triplane, which was wrecked during trials on May 26th, died from his injuries in Cambridge Hospital, Aldershot on May 28th. He never regained consciousness after the accident, his skull and spine being fractured.

Captain Dunn, along with Messrs. Carr, Lilywhite, Barrs and others from the Hendon aerodrome, went off the day war was declared and enlisted in the Royal Flying Corps, like the good sportsmen they were. They were promptly accepted as N.C.O. pilots, and all did good service at the Front.

Captain Dunne, after a strenuous period of war-flying, was given a commission for service in the field, and after a period came home, and was detailed for test work for the R.F.C. at Farnborough, a position for which his long experience of flying at home and on active service fitted him excellently. In due time he was promoted to Captain, R.F.C.

He was a splendid example of the keen and energetic young aviator who succeeded on his merits in winning promotion. His gallantry during a long period of active service entitled him to the comparative ease of life at home, and the way in which he handled new and experimental machines of all sorts showed that he had in no way lost his flying nerve.

His death is deeply to be regretted, for men of his experience and keenness can ill be spared by those who are working for the further progress of Aeronautics.

ENGAGEMENTS.

ASHMORE—PARSONS.—A marriage has been arranged and will take place in July, between Major-General E. B. Ashmore, C.B., C.M.G., M.V.O., Commandeur de la Légion d'Honneur, commanding the London Air Defences, and Betty, daughter of the Rev. F. W. Parsons, vicar of Tandridge and Rural Dean of Godstone, and Mrs. Parsons.

WHITAKER—SHARP.—The engagement is announced of Captain Raymond Whitaker, the Rifle Brigade and R.A.F., son of Mr. and Mrs. Arthur Whitaker, of 52, Cadogan Square, and Hilda Margaret Sharp, daughter of Lieut.-Colonel and Mrs. G. E. Sharp, of The Close, Salisbury.

BIRTHS.

GORDON-DEAN.—On May 29th, at Hampstead, to Helen, the wife of Major H. Gordon-Dean, York and Lancaster Regt. and R.A.F.—a son.

STAMMERS.—On May 24th, at Royston Lodge, Richmond, Surrey, the wife of Capt. F. G. Stammers, O.B.E., Royal Sussex Regt., and R.A.F., of a daughter.

AIR FORCE.

DEATHS.

HOLLICK.—Lieut. John Hollick, R.A.F., who was officially reported missing in France on May 18th, 1918, is now presumed killed in action on that date. He was the only son of Mr. and Mrs. Thomas Drake Hollick, Little Gaynes, Upminster, Essex, and was 19 years of age.

JACOBI.—Lieut. Edward Sydney Jacobi, R.A.F., who was killed in an aeroplane accident at Aldeburgh on May 24th, was the only son of Mr. and Mrs. Jacobi, of Blackheath.

M'EACHRAN.—Lieutenant Neil M'Eachran, 59th Squadron, R.A.F., who was instantaneously killed on May 20th in a flying accident at Düren, was the eldest son of Mr. and Mrs. Neil A. L. M'Eachran, Homelands, Thorntonhall, Lanarkshire. He was 24 years of age.

WRIGHT.—Cyril V. C. Wright, R.A.F., who died on May 24th, as the result of injuries received in a flying accident at Aldeburgh, was the husband of Laura Wright, Cotmandene, Aldeburgh, Suffolk.

ENGAGEMENTS.

KEMBALL-GIBSON.—The engagement is announced between Captain Stanley Kemball, late R.A.F., and Eileen, youngest daughter of Mr. and Mrs. T. S. Gibson, of Hillcote, Buckhurst Hill, Essex.

LOVEMORE—EDWARDS.—The engagement is announced of Lieut. R. B. Lovemore, D.S.O., R.A.F., elder son of Mr. and Mrs. W. B. Lovemore, of Swaziland, South Africa, and Miss Gwendolen Amy Edwards, only daughter of Mr. and Mrs. H. C. Edwards, of Sussex House, Raynes Park.

MARRIAGES.

ROLFE-ROGERS—MOORE.—On May 29th, at St. Mary's Cathedral, Glasgow, Capt. Ranville George Rolfe-Rogers, R.A.F., son of Mrs. Rolfe-Rogers, Bedford and Ceylon, was married to Katherine Ann Devereux Moore, Acting Administrator, W.R.A.F., eldest daughter of Mr. and Mrs. C. F. Moore, 6, Wilton Crescent, North Kelvinside, Glasgow, by the Very Rev. Provost Ambrose Lethbridge, M.A.

KEMP—SNOW.—The marriage between Capt. W. Kemp,

A.F.C., R.A.F., and Miss Snow took place on June 2nd, at St. Paul's Church, Knightsbridge.

BIRTHS.

MORRIS.—On May 20th, in Galway, the wife of Lieut. A. J. Morris, J.P., R.A.F., of a son.

MOSSOP.—On May 24th, at Bryn, Woodbridge, Suffolk, the wife of Capt. Noel R. Mossop, R.A.F., of a daughter.

WALKER.—On June 1st, at St. John's Wood, the wife of L. A. Walker, M.D., Capt. R.A.F., of 37, Piccadilly—a son.

* * *

It has been stated in a certain section of the Press that Serjt. Aldcock, R.A.F., died in hospital at Aldeburgh as a result of injuries received in a flying accident at Aldringham, Suffolk, on May 24th. This report was issued in error. Serjt. Aldcock has been removed to hospital at Colchester, and is progressing favourably.

FLYING IN AFGHANISTAN.

Apparently, the Afghans do not altogether fancy war in the air, as evidenced by bombing raids upon their towns and troops, and although the official communiqués cover the ground very thoroughly, for those who not only read but understand official communiqués the following extracts from reports of various special correspondents may be of interest.

The "Times" correspondent on May 18th wrote of the fear the Afghans entertain towards aircraft. He says: –

"The interrogation of prisoners emphasises the terrifying effect of air attacks. They were not afraid of rifle fire but were scared by big guns and aeroplanes. They state that 2,000 fighting tribesmen were in Dakka when it was bombed, and there were 100 casualties. Two hundred horses and other animals were killed.

Reuter, on May 18th, writes of the incident of the capture of two Air Force officers mentioned in an official communiqué last week.

On May 17th one aeroplane was forced to descend in the Bazar Valley. Lieuts. Barker and Hoare report that they were well treated by the Zakka Khel. The aeroplanes proceed daily into unknown and dangerous country, where no landing is possible. The machines go off at dawn, and often do not return till dusk. The Afghan abandonment of Dakka was largely due to the fear of aeroplanes. The machines greatly assisted the troops in the recent fighting, machine-gunning and bombing the enemy. They gave prompt information of the arrival of the Afghan levies on our flanks. The wounding by a bomb of the Afghan commander greatly impressed the population. Aeroplanes are dropping thousands of copies of the Viceroy's proclamation on the Jelalabad road.

Reuter is responsible for the two following statements, dated May 21st and May 25th respectively:—

A telegram reporting the aerial attacks of Jelalabad, says these bombing raids have been highly successful. In a night raid Capt. Carbery dropped four small bombs on the Amir's palace. In a day raid four bombs were dropped among 2,000 infantry on parade, inflicting about fifty casualties. The infantry scattered into the barracks, which were bombed in the next raid. Six direct hits were obtained, and all the bombs were dropped in the town, which is much damaged. Fifteen machines took part in the raid, and nearly two tons of bombs were dropped.

Our aeroplanes successfully bombed the murition factories at Kabul, securing seven hits. A large explosion followed. A second raid on Jelalabad was also effective. Several military buildings were damaged and observed to be in flames. The tribal lashkar in the Gandao valley were attacked by aeroplanes, and are reported to have been scattered northwards.

On May 30th, the "Morning Post" summing up the Afghan situation, says:—

"The frontier tribes, despite the attempts of Afghan agents to induce them to come in against the British, are remaining staunch, and there is no doubt that the success of bombing operations from the air has impressed the tribesmen with a salutary fear of the power of British arms.

R.34 IN A FOG.

On May 28th the Clyde-built airship R.34 was formally taken over by the Admiralty, having completed her tests. She left Inchinnan aerodrome for East Fortune the same night. But as the airship approached the East Coast she ran into thick mist, and after passing East Fortune cruised out over the North Sea, where the crew realised they were completely lost. They managed to return to East Fortune, and spent an anxious night over the aerodrome, in the hope that a landing would be possible in the morning. This was impossible, the fog being as bad as ever, and there was nothing for it but to remain aloft. The airship travelled as far as Yorkshire, and as the day wore on the situation of the crew, owing to lack of food and the strain of the protracted journey, became serious. They returned to East Fortune at 3.30 p.m. on May 29th, where, after a good deal of preliminary trouble with mist and wind, Colonel Hicks, the Commander, made a successful landing. General Maitland, Director of Airship Services, was aboard during the cruise.

THE NAVY'S AIRSHIP POLICY.

The Admiralty have under construction three rigid airships, one at the Beardmore Company's works, one at Bedford, and one at the Armstrong-Whitworth Company's works at Barlow, Yorks. These will form part of the fleet of eight airships which the Admiralty has decided to construct.

It is stated that the Admiralty will put these ships onto a regular aerial mail service, which seems a waste of good war material, but would appear to prove that the Admiralty has a greater amout of common sense than the Air Ministry.

THE PRIZE COURT.

The President (Lord Sterndale) on June 2nd, awarded £175 prize bounty to the pilot and air mechanic of H.M. seaplane 9860 for the destruction of the German submarine U.B.32.

Mr. L. F. C. Darby, on behalf of the claimants, read an affidavit by Arthur Edward Ingledew, formerly serving as air mechanic and flight cadet at the Royal Air Force Seaplane Station, Cherbourg, who said that on Aug. 18th, 1917, he was serving on board H.M. seaplane 9860 under the command of Flight Lieut. Charles Stanley Mossop, D.S.C., R.N.A.S., and when he was on patrol about 27 miles north of Cape Barlieu an enemy submarine was seen. The submarine was engaged by the seaplane, and was seen to sink. She was believed to be the U.B.32, and to have carried a crew of 35 hands all told. Lieut. Mossop was killed on active service on Aug. 12th, 1918.

THE ROYAL NAVAL, MILITARY AND AIR FORCE TOURNAMENT

The Royal Naval, Military and Air Force Tournament opens on June 26th. Already rehearsals for the Tournament are taking place on the Rhine, in France, at Woolwich, Aldershot, Deal, Portsmouth, Chatham, Plymouth, Dumblane, etc. The part to be played by the R.A.F. has not yet been announced.

THE MINISTRY ANNOUNCEMENTS.

The undermentioned landing grounds and aerodromes are being relinquished by the R.A.F.:—Orsett (Essex), Greenland Top (Yorks), Benton (Northumberland), Broomfield (Herne Bay, Kent), Dunkeswicke (Yorks), Gilmerton (Edinburgh), Grove Park (Kent), Hedon (Yorks), Horsegate (Durham), Henthorpe Gate (Yorks), Palmers Farm (Essex), Pluckley (Kent), Thornaby (Yorks), Westpole Farm (Herts), Winterton (Yorks).

The landing ground at New Chapel (Surrey) will not be available for a period of two months from May 24th.

ATHLETICS IN THE R.A.F.

Arrangements have been made for a selected R.A.F. Association football team to visit Holland, where it will play two games with representative sides.

The team, which was accompanied by Captain H. Greer, R.A.F., and Captain S. H. Harrower, R.A.F., left England on June 2nd, and will play its first game at Amsterdam on June 5th.

The men chosen to make the tour are:—

F. R. Wood (Millwall); J. Harrow (Chelsea), P. Barton (Tottenham Hotspur); E. Tomkins (Tottenham Hotspur), H. Lane (West Ham), M. Bell (Fulham); F. Adams (Leytonstone), W. Pick (Brentford), F. Norris (West Bromwich), B. Bliss (Tottenham Hotspur), G. J. Fox (Queen's Park Rangers).

Reserves:—G. F. Cannon (Fulham), M. Rist (Milwall), H. Lovesey (Watford), R. Crook (Milwall), R. A. Lindsell (Army).

W.R.A.F. GRATUITIES.

The Air Ministry announces that it is proposed to embody a special provision in the Finance Bill exempting from taxation benefits payable to officers and other ranks of the Women's Royal Air Force. No assessments on these benefits will therefore be made.

GRATUITIES TO POSTAL EMPLOYEES.

It has been decided that officers, warrant officers, non-commissioned officers, and airmen who, as postal servants, were entitled, whilst serving in the Air Force, to their full civil pay, are no longer precluded from receiving the discharge gratuities to which they are otherwise entitled under Articles 490 and 117 of the Royal Warrant for Pay.

This ruling, however, in no way affects the provision in paragraph 16c of Air Ministry Order No. 6 of 1919 excluding warrant officers, non-commissioned officers, and airmen from the war gratuity sanctioned by that order.

ACCIDENTS IN SWEDEN.

Two further fatal accidents to Swedish aviators on German aeroplanes are reported. This, it is stated, brings the total of Swedish fatalities due to aeroplane accidents to 22.

Telegrams: "AEROLITE, MANCHESTER."

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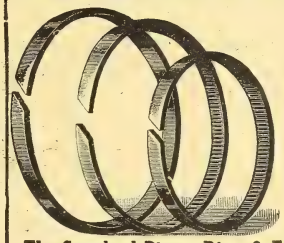
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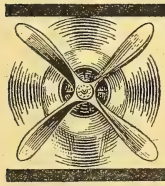
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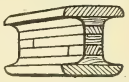
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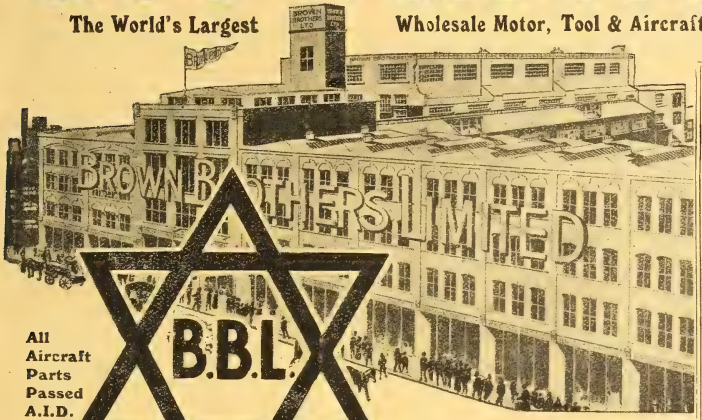
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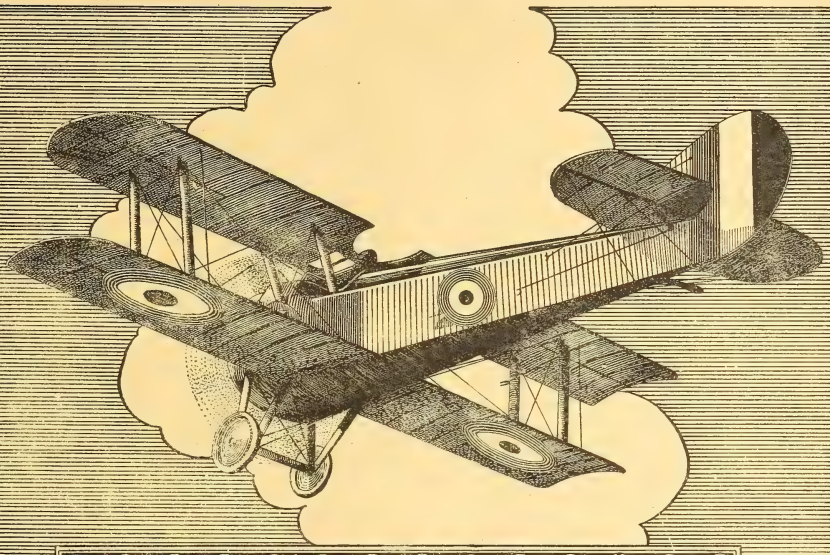
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ON THE REGULATION OF CIVIL AVIATION IN THE BRITISH ISLES.

(PART V.)

Last week it was necessary to withhold the further instalments of these Regulations owing to the American victory over the Atlantic. Having dealt with that historical event, one may now proceed to further discussion of the Regulations.

Schedule VII deals with Lights and Signals, and Rules of the Air. This Schedule is of great length, and it is therefore considered better to interpolate explanatory or other remarks where necessary into the Schedule itself rather than to print the whole Schedule and put the remarks all together at the end. Therefore the remarks will be found in the larger type customary on this page.

It is interesting to note that there are no "Directions" to correspond to these Regulations, though, as will be seen from the accompanying remarks, Directions are badly wanted in many instances to help aviators to understand the lighting and signalling rules. The more so as the Regulations are more vexatious than all the others put together.

Here followeth the Schedule:—

SCHEDULE VII.

Rules as to Lights and Signals and Rules of the Air.

INTERPRETATION OF RULES.

In these rules—

The word "aircraft" comprises all balloons, whether fixed or free, kites, airships, and flying machines;

The word "balloon," either fixed or free, shall mean an aircraft lighter than air, and having no means of propulsion;

The word "airship" shall mean an aircraft lighter than air, and having means of propulsion;

The word "flying machine" shall mean all aeroplanes, seaplanes, flying boats, or other flying machines heavier than air, and having means of propulsion.

The word "visible," when applied to lights, shall mean visible on a dark night with a clear atmosphere.

An airship is "under way" within the meaning of these rules when it is not made fast to the ground or any object on land or water.

The angular limits laid down in these rules shall be determined when the aircraft is in its normal attitude for flying on a rectilinear horizontal course.

So far so good. That is all very clear. But perhaps it would be well for the Air Ministry to explain here whether an airship whose engine has broken down and so deprived it of "means of propulsion," becomes a balloon within the meaning of the Act. One has to read twenty Regulations before finding the answer. It is well to have these axioms, as it were, laid down at the start.

1.—Rules as to Lights and Signals.

1. The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed navigation lights shall be exhibited. The said prescribed navigation lights must not be dazzling.

There seems to be just ground for complaint here. If motor-cars are only required to carry lights from an hour after sunset till an hour before sunrise, why should aircraft carry them for an extra two hours? The extra time means extra wear and tear on dynamos and extra load on engines all that time.

The question of what is and what is not dazzling ought also to be settled. Any light which is clearly visible a mile away—as an aircraft light should be, let alone at five miles, as demanded in the next clause—would be dazzling at fifty feet distance, and a light which would not dazzle at sunrise or sunset would be distinctly dazzling at midnight. Here there is a distinct need for Directions.

2. A flying machine when in the air, or manœuvring on land or water under its own power, shall carry the following lights:—

(a) Forward, a white light, visible in a dihedral angle of two hundred and twenty degrees bisected by a vertical plane through the line of flight, and of such a character as to be visible at a distance of at least five miles;

(b) On the starboard side, a green light, so constructed and fixed as to show an unbroken light between two vertical planes, whose dihedral angle is one hundred and ten degrees when measured to the right from dead ahead, and of such a character as to be visible at a distance of at least three miles;

(c) On the port side, a red light, so constructed and fixed as to show an unbroken light between two vertical planes whose dihedral angle is one hundred and ten degrees when measured to the left from dead ahead, and of such a character as to be visible at a distance of at least three miles;

(d) The said green and red sidelights shall be fitted so that the green light shall not be seen from the port side, nor the red light from the starboard side;

(e) At the rear, and as far aft as possible, a white light shining rearwards, and visible in a dihedral angle of one hundred and forty degrees bisected by a vertical plane through the line of flight;

(f) In the case where, in order to fulfil conditions (a) to (e) above, the single light has to be replaced by several lights, the field of visibility of each of these lights should be so limited that in no case can more than one be seen at a time.

It occurs to one that a white light visible at five miles (Paragraph (a)) and red and green lights visible at three miles (Paragraphs (b) and (c)) will require a fairly weighty dynamo to give the necessary candle-power, and that quite an amount of horse-power will be absorbed in driving it, whether it be driven direct off the engine or by a windmill fan. There seems to be scope here for some ingenious firm to devise small lights on the searchlight principle which will give the necessary range without undue weight.

Incidentally the white lights might find a ready sale among motorists who want headlights with the legal 5 inch front and the legal 24 candle-power which will light the road properly ahead.

Also it is worth noting that no indication is given in Paragraph (e) as to the required range of the tail-light. This apparently need only be visible at a range of a few feet.

3. The rules as to the lighting of flying machines shall apply to airships, subject to the following modifications:—

(a) All lights shall be doubled, the forward and aft lights vertically, and the side lights horizontally;

(b) Both lights of each pair forward and aft shall be visible at the same time.

The distance between each light comprising a pair shall not be less than six feet.

4. An airship, when being towed, shall carry the lights referred to in rule 3, and in addition those specified in rule 6 for airships not under control.

5. A flying machine, when on the surface of the water and when not under control, that is to say, not able to manœuvre as required by the regulations for preventing collisions at sea, shall carry two red lights not less than six feet apart in a vertical line one over the other, and of such a character as to be visible all round the horizon at a distance of at least two miles. In addition the side lights must be shown if the flying machine is under way.

Further weight and complication is here added to the burden of the machine and its owner. In the first place, one may assume that nobody is going to carry naked lights—either oil or acetylene—on an aeroplane or seaplane. Therefore accumulators must be carried which are capable of giving the required light from sunset to sunrise. Secondly, if a light is to be visible all round the horizon at a distance of two miles, it must be placed above the uppermost plane of the seaplane, otherwise it will be obscured aft by the tail and fuselage, and therefore the machine must carry a telescopic mast or something of that nature which will elevate the second light six feet above the lower one.

6. An airship, which from any cause is not under control, or which has voluntarily stopped her engines, shall, in addition to the other specified lights, display conspicuously two red lights, one over the other approximately in a vertical line, not less than six feet apart and constructed to show a light in all directions and of such a character as to be visible at a distance of at least two miles.

By day an airship, when being towed, or which from any cause is not under control, shall display conspicuously two black balls or shapes, each two feet in diameter, placed one over the other and approximately in a vertical line.

An airship moored or under way, but having voluntarily stopped its engines, shall display conspicuously by day a black ball or shape two feet in diameter, and shall be treated by other aircraft as being not under control.

The poor airshipper is apparently asked to solve an impossible problem. In the first place, if two lights are in a vertical line, how can each "show a light in all directions"? One must obscure the other from an observer directly above or below them. Secondly, if the lights are hung below the ship, how can they be seen from above, and if they are stuck up above how are they to be seen from below? There is need here again for explicit Directions on the point.

7. A free balloon shall carry one bright white light below the car at a distance of not less than twenty feet, and so constructed as to show an unbroken light in all directions and of such a character as to be visible at a distance of at least two miles.

The balloon is, it seems, even worse treated. How is a light 20 feet below the car to show "an unbroken light in all directions" with a huge gas bag right over the top of it?

8. A fixed balloon shall carry in the same position as the white light mentioned in rule 7, and in lieu of that light three lights in vertical line one over the other, not less than six feet apart. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible in all directions at a distance of at least two miles.

In addition the mooring cable shall have attached to it at intervals of one thousand feet, measured from the basket, groups of three lights similar to those mentioned in the preceding paragraph. In addition, the object to which the balloon is moored on the ground shall have a similar group of lights to mark its position.

By day the mooring cable shall carry in the same positions as the groups of lights mentioned in the preceding paragraph, and in lieu thereof, tubular streamers, not less than eight inches in diameter and six feet long, and marked with alternate bands of white and red eighteen inches in width.

If kite-balloons are used largely, as they will be in due course, for mark-buoys over aerodromes, it is obviously necessary that their position should be well and distinctly indicated, and especially that the line of their cables should be seen easily. But these regulations seem to put a fairly big load on them. It may be possible to produce a K.B. cable which will carry an electric light wire as well as a telephone wire, so that the K.B. can take the power for her lights off the ground. Otherwise she will have to carry accumulators, and/or a dynamo with a windmill drive. Nevertheless, it is probable that the new K.Bs. invented by Major Avorio and Dr. Prassone and improved by the K.B. section of the London Air Defence Area, will make little trouble about lifting the weight after what they did in the way of lifting K.B. aprons.

Perhaps the tubular streamers—or drogues—along the cable will be still more troublesome than the lights, for the drag on such streamers is quite considerable, and will tend to pull the whole K.B. bodily down wind, if the breeze has any great strength. Still, all these complications will only add interest to the lives of the K.B. experts, who, now that there is no more war for the time being, must find things fairly dull. The added burdens do not, at any rate, add to the difficulties of navigating an aircraft which, if it is to be a paying commercial proposition, must always be loaded up to its safety limit when starting.

9. An airship, when moored near the ground, shall carry the lights referred to in rules 2 (a) and (e) and 3.

In addition, if moored but not near the ground, the airship, the mooring cable, and the object to which moored, shall be marked in accordance with the provisions of rule 8, whether by day or by night.

Sea anchors or drogues used by airships for mooring purposes at sea are exempt from this rule.

Here again Directions are needed. When is an airship moored "near the ground" and when is it not? An airship which was 90 feet from keel to truck would be moored near the ground if her nose were anchored to a mast 100 feet high. But a "Blimp" moored to the same mast would be away up in the sky.

10. A flying machine stationary on land or water, but not anchored or moored, shall carry the lights specified in rule 2.

In other words, if an aviator makes a forced landing in a meadow, miles from any help, and has to leave his machine in the open all night, it must carry head, side, and tail lights from sunset to sunrise, five-mile range and all. It occurs to one that some hundredweight of accumulators will have to be carried in every aeroplane, day and night.

11. In order to prevent collisions with surface craft—

(a) A flying machine when at anchor or moored on the water shall carry forward where it can best be seen a white light so constructed as to show an unbroken light visible all round the horizon at a distance of at least one mile.

(b) A flying machine of one hundred and fifty feet or upwards in length, when at anchor or moored on the water, shall in the forward part of the flying machine carry one such light, and at or near the stern of the flying machine, and at such a height that it shall be not less than fifteen feet lower than the forward light, another such light.

The length of a flying machine shall be deemed to be the overall length.

(c) Flying machines of one hundred and fifty feet or upwards in span, when at anchor or moored in the water shall carry in addition at each lower wing tip one such light as specified in (a) of this rule.

The span of a flying machine shall be deemed to be the maximum lateral dimension.

This should be compared with Clause 5. It seems that one has to carry (permanently) a special set of "out of control" lights and another set of mooring lights. Apparently the genius who framed these Regulations imagines that every aeroplane carried a signal-locker for flags and lamps as big as that on a liner.

The lights to be carried thus include headlight (Clause 2, Paragraph (a)), tail-light (2 e), two side-lights (2 b and c), two "out of control lights" (Clause 5), head and tail light for use when at moorings (11 b), wing-tip lights for use when at moorings (11 c), and top light for use when at moorings (11 a).

One recalls that in his brilliant Wilbur Wright Memorial Lecture some two years ago Lieut.-Colonel Mervyn

O'Gorman remarked that one of the things which he feared most about peace-flying was the overloading of commercial aeroplanes by official demands for the safety of passengers and the public. It seems as if these Lighting Regulations are a step in that direction.

12. In the event of the failure of any of the lights specified under these rules to be carried by aircraft flying at night, such aircraft shall land at the first reasonably safe opportunity.

13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to the additional station and signal lights for two or more military aircraft or for aircraft in formation, or with the exhibition of recognition signals adopted by owners of aircraft which have been authorised by their respective Governments and duly registered and published.

14. (a) Aircraft proposing to land at night on aerodromes having a ground control shall before landing—

Fire a green Very's light or flash a green lamp, and in addition shall make by international Morse code the letter group forming its call sign.

(b) Permission to land will be given by the repetition of the same call sign from the ground, followed by—

A green Very's light, or flashing a green lamp.

15. The firing of a red Very's light or the display of a red flare from the ground shall be taken as an instruction that aircraft are not to land.

16. An aircraft compelled to land at night shall, before landing, fire a red Very's light, or make a series of short flashes with the navigation lights.

Clause 12 seems fairly obvious, and Clause 13 is no affair of the general public, but Clause 14 finds us back on the overloading question again. If an aircraft which is compelled to land at night can signal with its navigation lights, why should it not Morse its call sign with its headlight? Why load it up still further with Véry pistols and green lamps?

17. When an aircraft is in distress and requires assistance, the following signals shall be used or displayed, either together or separately:—

(1) The international signal, S.O.S., by means of visual or wireless signals;

(2) The international code flag signal of distress, indicated by NC;

(3) The distant signal, consisting of a square flag, having either above or below it a ball, or anything resembling a ball;

(4) A continuous sounding with any sound apparatus;

(5) A signal, consisting of a succession of white Very's lights, fired at short intervals.

One fails to see why white Véry's lights should be a distress signal. Surely red lights, which are known the world over as danger signals, would be more sensible. As regards Paragraph (4), presumably the banging and grinding of a heavily deteriorated engine would be accepted as "a continuous sounding" within the meaning of the Act.

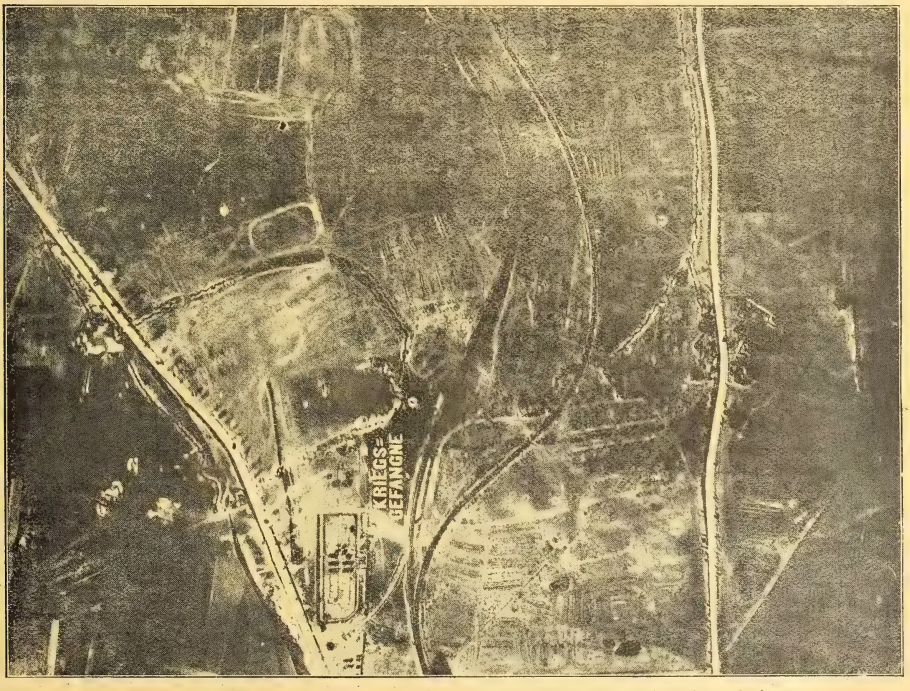
18. In fog, mist, falling snow, or heavy rainstorm, whether by day or night, an aircraft on the water shall make the following sound signals with any sound apparatus:—

(a) if not anchored or moored, a sound at intervals of not more than two minutes, consisting of two blasts of about five seconds duration, with an interval of about one second between them;

(b) if at anchor or moored a sound at intervals of not more than one minute, consisting of one blast of about five seconds duration.

Which adds to the burden of the aircraft a syren, horn, or other noise instrument. There seems to be a chance here for a smart designer to produce an exhaust-pipe which, when blown the other way, will serve as a key-bugle.

Altogether one sees in these Lighting Regulations some fine opportunities for the air-police—or "cloud-cops," as our American relatives have called them.



A German Aerial Photograph showing how the French indicated the position of Prison Camps to them.

There are all the old openings for quibbles just like those on which foolish old magistrates, out for cheap popularity with the mob, fine perfectly innocent motorists. It is difficult to make up one's mind whether the people who framed these particular Regulations are in league with the police or whether they have shares in some of the electrical fittings firms, or both.

We can now proceed to consider the Rule of the Road as applied to aircraft :—

II.—Rules of the Air.

(a) General Rules of the Air.

19. Flying machines shall always give way to balloons, fixed or free, and to airships. Airships shall always give way to balloons, whether fixed or free.

20. An airship when not under its own control shall, for the purposes of the rules of the air, be classed as a free balloon.

21. A motor-driven aircraft must always manœuvre according to these rules as soon as it is apparent that, if it pursued its course, it would pass at a distance of less than 200 yards from any part of another aircraft.

22. When two motor-driven aircraft are meeting end on, or nearly end on, each shall alter its course to starboard.

23. When two motor-driven aircraft are on courses which cross, the aircraft which has the other on its own starboard side shall keep out of the way of the other.

So far all is plain sailing and eminently reasonable. It is particularly sensible to adopt the universal rule of "Keep to the Right" in passing. It is only a pity that we do not adopt the same rule for road traffic also.

24. An aircraft overtaking any other, shall keep out of the way of the overtaken aircraft by altering its own course to the right, and must not pass by diving.

Every aircraft coming up with another aircraft from any direction more than one hundred and ten degrees from ahead, i.e., in such a position with reference to the aircraft which it is overtaking, that at night it would be unable to see either of that aircraft's sidelights, shall be deemed to be an overtaking aircraft; and no subsequent alteration of the bearing between the two aircraft shall make the overtaking aircraft a crossing aircraft within the meaning of these rules, or relieve it of the duty of keeping clear of the overtaken aircraft until it is finally past and clear.

As by day the overtaking aircraft cannot always know with certainty whether it is forward or abaft this direction from the other aircraft, it should, if in doubt, assume that it is an overtaking aircraft and keep out of the way.

Some different hand seems to have been at work here. Why, having used the word "starboard" so far, should the drafter of the Regulations suddenly take to the word "right"? It is apt to be confusing to foreigners, and even to our own people, as suggesting that it is put there on purpose and means something different from "starboard." Also what on earth, or in the air, is meant by "from any direction more than 110 degrees from ahead"? The whole sentence is obscure and needs explanatory Directions, if not a Dictionary.

25. Where by any of these rules one of the two aircraft is to keep out of the way, the other shall keep its course and speed. When in consequence of thick weather or other causes, such aircraft finds itself so close that collision cannot be avoided by the action of the giving-way aircraft alone, it shall take such action as will best aid to avert collision.

26. Every aircraft which is directed by these rules to keep out of the way of another aircraft shall, if the circumstances of the case admit, avoid crossing ahead of the other.

Further Regulations or Directions are needed here also. In Clause 25 there might be a rule that one or the other must dive and the other zoom up, but as at present decreed both might do the same thing and cause a collision instead of avoiding it. And, so far as Clause 26 is concerned, crossing ahead ought to be forbidden in any case to any craft which has to get out of the way of another.

27. In following an officially recognised aerial route every aircraft, when it is safe and practicable, shall keep to the right side of such route.

28. Aircraft on land or water about to ascend shall not attempt to "take off" until there is no risk of collision with alighting aircraft.

29. Every aircraft in a cloud, fog, mist, or other conditions of bad visibility, shall proceed with caution, having regard to the existing circumstances and conditions.

30. In obeying and construing these rules, due regard shall be had to all dangers of navigation and collision and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

31. The dropping of ballast other than fine sand or water from aircraft in the air is prohibited.

Clause 27 seems to require rather fine navigation. One would need to be fairly expert to keep to the right of a line from Hounslow to Plymouth if above the clouds, but the injunction is well meant.

Clause 28 is entirely commendable. Pilots are notoriously careless in this matter.

Clause 29 seems unnecessary. One cannot go "dead slow" in an aeroplane as in a ship at sea in a fog.

Clause 30 seems to afford a loophole for every aviator who breaks any or all of the preceding eleven rules, and is therefore perhaps the most useful of the lot.

And Clause 31 seems to put an end to the dropping of leaflets, bundles of papers, and parachutes—with or without human burdens—until some special rules are made to deal with such acts.

We may now consider the Regulations affecting aerodromes in particular, as distinct from the Rule of the Road :—

(b) Regulations for Air Traffic on and in the vicinity of Licensed Aerodromes.

32. At every licensed aerodrome there shall be a flag hoisted in a prominent position which shall indicate that if an aeroplane about to land finds it necessary to make a circuit or partial circuit such circuit shall be left-handed (anti-clockwise) or right-handed (clockwise) according to the colour of the flag. A blue flag shall indicate a right-handed circuit, i.e., that the flag is kept to the starboard side or side which carries the green light of the aircraft, and a red flag shall indicate a left-handed circuit, i.e., that the red flag is kept to the port side or side which carries the red light of the aeroplane.

Similarly aeroplanes leaving a licensed aerodrome shall conform to the circuit as indicated by the flag.

The signal seems to be inadequate, in view of the fact that a flag flapping from a staff in a light breeze is scarcely the most visible of objects from a height of 2,000 or 3,000 feet. A ground-sheet signal would be better.

33. When an aeroplane starts from a licensed aerodrome it shall not turn until five hundred yards distance from the nearest point of the aerodrome, and the turning then made must conform with the circuit regulation.

This regulation is a standing danger to all passengers. It means that a machine starting from a dangerous aerodrome, such as Kenley or Hendon—surrounded in the former case by ravines and trees and in the latter by houses and railway lines—must not turn inside the aerodrome and get its height before leaving, but must push straight off over the surrounding country, regardless of what may be below it, so that if its engine fails it is certain of a crash.

Presumably the fellow who drafted this regulation did not want crashed machines making a mess in his aerodrome. In any case he is a born fool, who either knows nothing about flying or else cares nothing for the welfare of aviation.

34. All aeroplanes flying between five hundred and one thousand yards distance from the nearest point of a licensed aerodrome shall conform to the circuit law, unless such aeroplanes are flying at a greater height than six thousand five hundred feet.

35. Side-slip and trick landings are prohibited at licensed aerodromes. Aircraft are prohibited from indulging in trick flying within a distance in any direction of at least two thousand yards from the nearest point of such aerodromes.

As regards Clause 34, there is little enough at which to complain, for one can fly straight into an aerodrome and yet comply with the circuit law so long as one keeps well over to one side. But Clause 35 is another example of assininity, for under many circumstances a side-slip landing is the safest and best possible. As regards trick flying, which would be the more dangerous, stunt-

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ing over Hendon Aerodrome or stunting over Hendon Village 2,000 yards away? Truly the draftsman of this section of the Regulations is a prize ass.

36. At every licensed aerodrome the direction of the wind shall be clearly indicated by one or more of the recognised methods, e.g., landing tee, conical streamer, smudge fire, etc.

37. Every aeroplane, when taking off or alighting on a licensed aerodrome, shall do so up-wind, except when the natural conditions of the aerodrome do not permit.

38. In the case of aeroplanes approaching licensed aerodromes for the purpose of landing, the aeroplane flying at the greater height shall be responsible for avoiding the aeroplane at the lower height, and shall, as regards landing, observe rule 24 as to passing.

39. Aeroplanes showing signals of distress shall be given free way in attempting to make a landing on a licensed aerodrome.

40. Every licensed aerodrome shall be considered to consist of three zones when looking up-wind. The right-hand zone shall be the taking-off zone and the left-hand shall be the landing zone. Between these two there shall be a neutral zone. An aeroplane when landing should attempt to land as near as possible to the neutral zone, but in any case on the left of any aeroplanes which have already landed. After slowing up or coming to a stop at the end of its landing run, an aeroplane will immediately taxi into the neutral zone. Similarly an aeroplane when taking off shall keep as far as possible towards the right of the taking-off zone, but shall keep clear to the left of any aeroplanes which are taking off or about to take off.

41. No aeroplane shall commence to take off until the preceding aeroplane is clear of the aerodrome.

42. The above rules shall apply equally to night landings on licensed aerodromes, when the signals shall be as follows:—

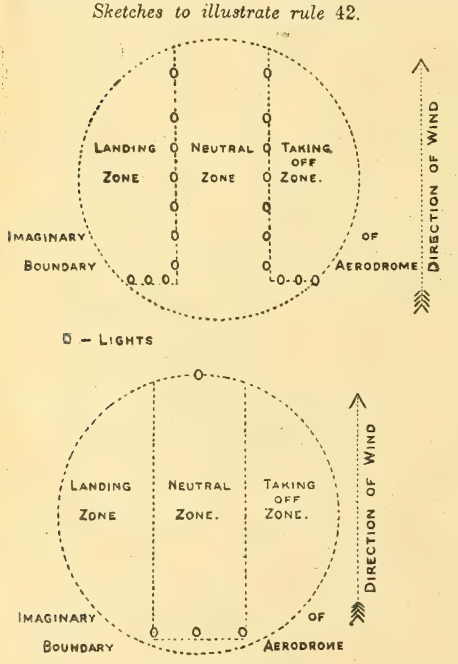
(a) A red light shall indicate a left-hand circuit and a green light shall indicate a right-hand circuit. The right-hand zone will be marked by white lights placed in the position of an "L," and the left-hand zone will be similarly marked. The "L's" shall be back to back, that is to say that the long sides of the "L's" will indicate the borders of the neutral zone. The direction of landing shall invariably be along the long arm of the "L" and towards the short arm. The lights of the "L's" should be so placed that the lights indicating the top extremity of the long arm shall be the nearest point on the aerodrome upon which an aeroplane can safely touch ground. The lights indicating the short arm of the "L" should indicate the limit of safe landing ground for the aeroplanes, that is, that the aeroplane should not over-run the short arm. (See sketch below.)

(b) Where it is desired to save lights and personnel, the following system may be used:—

Two lights shall be placed on the windward side of the aerodrome to mark the limits of the neutral zone mentioned in rule 40, the line joining the lights being at right angles to the direction of the wind; two more ligits shall be placed as follows: one on the leeward side of the aerodrome on the line drawn parallel to the direction of the wind and passing midway between the two lights on the windward side, for showing the extent of the aerodrome and the direction of the wind, and the other shall be placed midway between the two lights marking the limits of the neutral zone.

Additional lights may be symmetrically put along the boundary lines of the neutral zone and on the ends of the taking-off and landing zones, on the line through the three lights on the windward side. (See sketch below.)

Sketches to illustrate rule 42.



AN OFFICIAL ERROR.—Compare the Sketch with Clause 40

There is ordinary common sense in the Clauses between 36 and 42 inclusive, except for the fact that, as "The Lincoln Imp" pointed out a week or two ago, the draftsman and the draughtsman of Regulations 40 and 42 were evidently a bit mixed. The official sketch is reproduced herewith, and from it one sees that the right-hand zone looking up-wind is marked as the landing zone, and not as the taking-off zone as stated in Clause 40. Since then the Ministry seems to have discovered its mistake, for a corrected sketch in accord with the rule was issued on June 10th.

The only other point is that which says that a machine may not leave the ground till the preceding one is clear of the aerodrome. What happens if the preceding machine is merely piloted by a pupil who is doing circuits *inside* the aerodrome? Or must pupils have a special aerodrome of their own? Or must pupils go outside and fly over the house-tops? Or are ordinary machines forbidden to use aerodromes where pupils evolute? More Directions seem to be needed on these points.

43. No fixed balloon, kite or moored airship shall be elevated in the vicinity of any aerodrome without a special authorisation.

44. All licensed aerodromes must be protected on land within a zone of five hundred yards by means of suitable markings on obstacles dangerous to flying.

Will somebody please explain to a long-suffering aeronautical population what on earth Clause 44 means? How does one "protect" an aerodrome by "suitable markings on obstacles dangerous to flying"? Presumably the imbecile draftsman means that aviators using the aerodrome must be protected against accidents "by etc., etc."

(c) Miscellaneous.

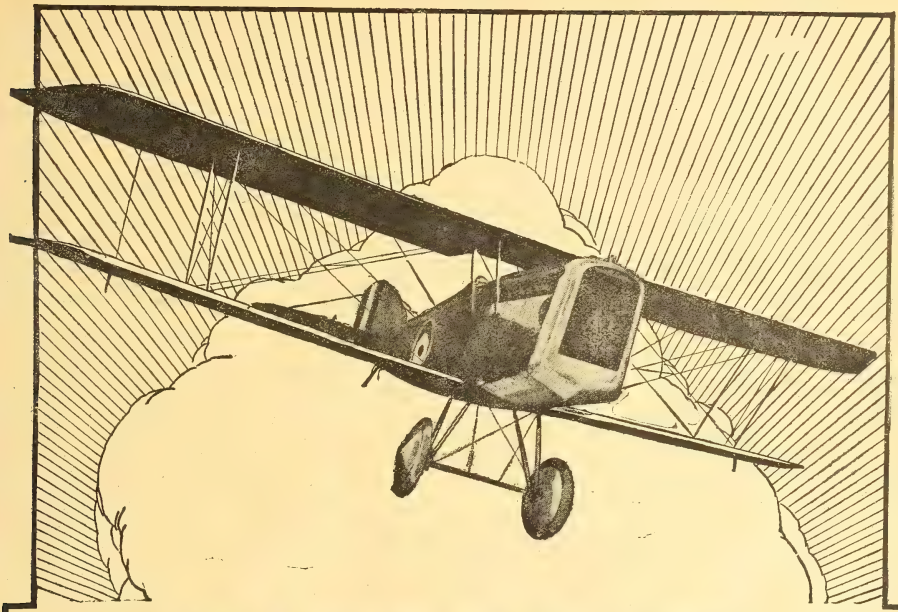
45. Every aircraft manœuvring under its own power on the water shall conform to the regulations for preventing collisions at sea, and for the purposes of those regulations shall be deemed to be a steam vessel, but shall carry the lights specified in these rules, and not those specified for steam vessels in those regulations. The sound signals specified in those regulations shall not be used by or apply to such aircraft, except as specified in rules 17 and 1 above.

46. Nothing in these rules shall exonerate any aircraft, or the owner or personnel thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper look-out, or of the neglect of any precaution which may be required by the ordinary practice of the air, or by the special circumstances of the case.

47. Nothing in these rules shall interfere with the operation of any special rule or rules duly made and published relative to navigation of aircraft in the immediate vicinity of any aerodrome or other place, and it shall be obligatory on all owners and personnel of aircraft to obey such rules.

The last three Clauses seem free from objection, and do not seem to call for special explanatory Directions. But one hopes most sincerely that General Sykes' department will be quick about issuing Directions concerning the points to which one has drawn attention in the foregoing notes.

These Rules of the Air are certainly the worst worded and the worst arranged of all the Schedules in the Regulations. The person who drafted them is evidently quite unfamiliar with aerodrome flying, and apparently knows little enough about flying of any sort. They strike one



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as having been compiled by a Naval Officer, or a syndicate of Naval Officers, who has or have just squeezed through his or their flying tests in order to qualify for high command in the Air Force, and who, having nothing else to do, and knowing as much or as little as the average N.O. knows about navigation at sea, has or have been turned on to compose Rules of the Air for people who have forgotten more about flying than he or they is or are ever likely to learn.

THE NEXT INSTALMENT.

One had hoped to finish with these Regulations in this issue, but there still remain the Rules as to Aircraft Arriving in or Departing from the United Kingdom, and there are also certain Directions affecting R.A.F. Aerodromes and Licensed Aerodromes. Therefore, a further instalment of these notes is necessary, and one hopes to discover other interesting points for discussion in the next batch.—C. G. G.

A MATTER OF HOSPITALITY.

It would seem that those in High Places might well give attention to the way in which the Admiralty and the Air Ministry have handled the reception of those gallant officers of the United States Navy who have succeeded in flying across the Atlantic, or who have arrived in this country after making World's Record flights over the Atlantic.

In the first place, one is informed that, although both the Admiralty and the Air Ministry were informed of the time at which these officers would arrive in London on Sunday, May 31st, no official representative of the Navy nor of the R.A.F. met them. Nor were any official cars sent to convey them to their hotels.

The only official car was one belonging to the American Government. The rest of the transport was provided by private members of the Royal Aero Club, not even by the Club officially. And it is worthy of note that the first of these cars, that which conveyed Lieut.-Commander Read, was owned and driven by Mr. Harry Hawker, who thus vindicated our reputation for sportsmanship by doing honour to his successful rival for the credit of being first across the Atlantic by air.

Furthermore, one is informed that during the past week somebody at the Air Ministry inquired as to the days on which the N.C. crews would be at liberty, and the information was given that they were free any day up to Monday last—the assumption being that it was intended to organise some sort of official evening function in their honour. Nevertheless, nothing of the sort has been done.

It is true that they were entertained at lunch by Major-General Seely, on Thursday of last week, at the House of Commons, but that was purely a personal affair of the Under-Secretary for Air, a wholly enjoyable function of an informal and very friendly nature, but it was not in any sense the official reception which was their due, and it was largely concerned with the affairs of the British Aircraft Industry. It is not that the American Naval officer loves official functions any more than does the British N.O., but surely it was up to us as a Nation, for the sake of our reputation for doing the right thing in the right way, to make some properly official recognition of the epoch-making flight of these aviators.

Little as the Air Ministry has done—and that little of a personal nature—the Navy has done nothing at all to welcome these officers of an Allied Navy. Whatever entertainment has been given to them in this country has been given entirely by private individuals.

Even the award of the A.F.C. to certain members of the N.C. Squadron is not quite what should have been done, for it omits entirely any recognition of the crews of N.C.1 and N.C.3, who, though they did not qualify for the A.F.C. by completing the journey by air, certainly deserved official recognition of some sort.

Not only the Navy and the R.A.F., but the Royal Aero Club and the Royal Aeronautical Society as well, have failed to recognise the importance of the occasion. As a fine sporting effort the flight should have been duly celebrated by the Committee of the Royal Aero Club, which professes to govern the sport of aviation in this country.

As a great scientific success, a triumph of aerial navigation, technical design, practical work on aeroplanes and engines, and organisation of aerial signalling and aircraft handling, not to mention the fact of its being an event which marks a new era in the history of aeronautics, the flight should have been fitly recognised by the Council of the Royal Aeronautical Society, which professes to be the Imperial authority on the science of aerial navigation and all concerned therewith.

Both associations have missed the proper moment at which to do the right thing. Their respective elected managing bodies will perhaps awake to their duty after the N.C. crews have left this country—or they may do so before—but the crucial moment for action is past.

A lamentable example of our English way of doing things was seen at Plymouth, where the representatives of the Town or City, or whatever it is, invited the crews of the N.Cs. and certain other American Service people to a dinner on the night of their arrival, but, with characteristic lack of thoroughness, never took the trouble to secure a complete list of the said crews, nor to see that all were invited. The result was that the Officer Commanding one of the N.C. boats and one of his subordinates dined at their own expense at the local hotel.

One gathers that all of the American visitors were allowed to pay their own hotel bills at Plymouth, and one presumes that they will all be allowed to pay their own bills in London, though in any well-ordered state of society they would be the guests of the Nation—as they would doubtless have been if they had been carpet-bag politicians on the cadge from some miserable little "self-determining" State which had had the impudence to break away from a great empire with a glorious history.

Lieut.-Commander Read did us the honour of assuring us at General Seely's lunch that we Britons are good winners but wonderful losers. One will add further that we are damned bad hosts.—C. G. G.

THE PRINCE OF WALES AT THE SOPWITH COMPANY'S WORKS.

On June 5th H.R.H. the Prince of Wales, K.G., drove to Kingston-on-Thames to inspect the works of the Sopwith Aviation Company, Ltd. He was received by Mr. T. O. M. Sopwith, Mr. R. O. Carey (managing director), Mr. H. P. Musgrave (secretary and organising manager), Mr. L. Fowler (factory superintendent), and Mr. H. Mitchell (works manager).

After the experimental shops had been visited, the Prince drove to the new factory at Ham.

THE AUSTRALIAN £10,000 FLIGHT.

It was announced on June 7th that Lieut. E. C. Kingsford-Smith, M.C., R.A.F., Lieut. V. Rendle, R.A.F., and Lieut. C. B. Maddocks, will start from Hounslow on June 11th, on the Blackburn biplane (Rolls-Royce engines), on the first stage of the Australian Flight.

One would like to know how this has been arranged, in view of the fact that a pilot who wished to start some weeks ago was held back to await the publishing of the International Air Laws.

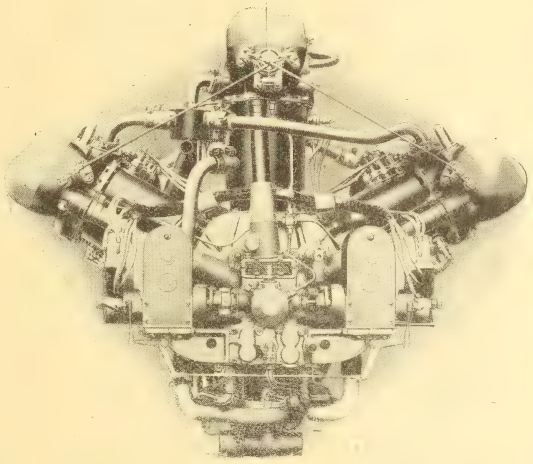
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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

A New Terror.

According to the writer of an article in the "Daily Mail":—

"There will be a particularly keen demand for the stamps from the 100 letters which Mr. Hawker attempted to bring over from America on his Atlantic flight, but aerial stamps which are without such a romantic interest also will be in big demand.

"Particularly eager are stamp collectors to obtain the first stamp specially issued for aerial services.

"So far none has been issued, the policy adopted in the United States and for the mails carried by Mr. Hawker being to surcharge the ordinary letter stamp and endorse these 'Aerial Mail Service,' or, in the case of the Atlantic mail, 'First trans-Atlantic Aerial Mail, April, 1919.' There is, however, in production a special stamp for the American aerial postal service, and it will be interesting to see what demand is made for the first copies to arrive in this country."

This suggests a new industry. In this strange world there are literally millions of children of all ages who prefer the hunting of rare stamps to any other kind of athletics. One has heard of small South American States hardly visible to the naked eye that have obtained from the frequent issue of stamps for collectors their revenue for everything from the salaries of their Presidents to the necessary disbursements connected with the assassination of would-be Presidents.

However, the possibility of every nation having special stamps for aero mails is somewhat appalling. One can imagine the conventionalised aeroplanes that would be depicted by the British official stamp designers who would, of course, be told that they must not advertise any particular make of machine. Probably these stamp pictures would show something like a cross between a Handley Page and a Sopwith monoplane, or the Tarrant and the R.34 airship with the figure of Britannia heiping it off the ground with her trident.

The Quest for Freedom.

The "Daily News" has been offering free flights to its readers. Apparently those who wish to fly have to fill in coupons, a task that should be easy after the training they have had in the filling up of forms during the war. The newspaper states that the coupons are "to be mixed up in a huge sack, and the successful applications will be drawn at random by a blindfolded member of our staff."

One reader has written:—

"My reason for wanting a flight is to be able to enjoy absolute freedom of mind and body. When I am on my bicycle somebody or something is always getting in my way. Then there is always the fear of a police trap. As there are not any air police yet to pull you up for going too fast, I think it would be a great joy to ride in your Handley Page."

One fears that this gentleman who seeks absolute freedom of mind and body will be disappointed. If the roar of two powerful engines and the novelty of a first flight give him absolute freedom of mind he must be curiously constituted. After reading his remarks (most of which have been suppressed, no doubt) about the people and things that get in the way of his bicycle one feels that what would really give him freedom of mind would be a trip in a tank.

Within the Speed Limits.

The U.S.A. War Department states that:—

"Fairfax Naulty of New York has through the means of the cinema camera, it is claimed, been able for the first time to photograph air in motion across the wings of an airplane. The making of the photographs commenced in January, and three miles of films have been made at Bolling Field, the development of which has just been completed. The photographs show, it is said, much that will in the future be a guide to the construction and operations of airplanes."

One hopes that in the next statement the words "it is claimed" and "it is said" will be omitted. One likes official announcements to be definite. If the experiments were commenced in January and the films have only just been developed, it would appear that Britain is not the only country that moves cautiously at times. One remembers a remark that there are people slower than officials, less enterprising and less energetic—but they are dead.

A Clever Feat.

It is reported by the War Department of the U.S.A. that Sec. Lieut. T. S. K. Reed managed to right an aeroplane that had turned on its back and then landed it successfully after the joy-stick had broken off five inches from the socket.

The efficiency of the pilot is evidently greater than that of the manufacturers of the joy-stick.

More Insurance for Aviators.

An experienced aviator who has recently been to certain Jazz entertainments with others of his kind suggests that those companies recently formed for the purpose of aeronautical insurance might well turn their attention to insuring aviators against dancing risks—particularly including third-party insurance. Side-slip landings being forbidden to commercial aviators under Air Ministry Regulations it is doubtful whether it would be legal to insure against consequent accidents, but tail-slides should certainly be covered. It would seem that there is no need to make a reduction in the premium payable by comparatively senior officers, as neither age nor experience seem to secure immunity from accident under these circumstances.

Another Naval Occasion.

A correspondent sends the following true story concerning the efficiency (?) of Naval anti-aircraft gunnery which, he thinks, may be of interest to civilian pilots who contemplate flying over prohibited areas.

"To begin with, the Navy remained in a state of blissful ignorance as to the difference between our own and enemy aircraft right up to the Armistice. The subject simply bored them, and it was impossible to get a Naval look-out to raise his eyes above the horizon.

"On one occasion when the Fleet was in enemy waters, hostile seaplanes appeared. As usual, the first notification of their presence was the explosion of a bomb near a destroyer. A Camel was flown off the deck of an adjacent light cruiser, and the Huns made for home with noses down and engines full out. A much-advertised flag-ship was away to the South, and as the chase passed over her, she failed to see the Huns and poured a devastating fire in the direction of the Camel. Having got into a regular panic and exhausted all the A.A. ammunition on deck, it occurred to the Mandarins on the bridge that perhaps the flying officer she carried had been right after all in saying the machine was one of our own. Anyway, she ceased fire and the incident was closed.

"The sequel occurred a few days later in port, when the pilot of the Camel happened to come aboard.

"The gunnery Lieut. was very conceited about the efficiency of his beloved weapons, but evidently thought some explanation was due to the pilot. So, swallowing his dignity, he unbent, saying in a condescending manner, 'Sorry we opened fire on you the other day. Hope we did not——'

"The pilot turned to him, and, in absolute innocence, remarked, 'Did you really, Sir? I didn't notice it.'

"So you know what to expect when the Naval guns open out at you from a 'prohibted area.'"

Ex-Pilot.

A Critic Bites Back.

Sir,—"Sale métier de dragon!" as Kraken said in that jolly book "L'Ile des Pingouins."

A dragon's *is* a dreary life, when cross authors (gravelled for lack of matter) accuse one of unpopular traits to "get even." Why it should be "insulting" to "good men" to suggest that they exhibit the same trait as Socrates, Alfred Lester, or Abraham Lincoln, I cannot conceive. It is precisely this *ad captandum* manner which comes so near to spoiling Mr. Cable's work. And may I suggest a certain deficiency in humour?

His quibbles are as disingenuous as his perfervid defence of men who have not been attacked. I am sorry that he does not like M. Mortane's very well-known phrase, "Poilus of the blue."

Let me repeat that I "can certainly recommend his book." And I enjoyed his letter!

R. H. B.

P.S.—Permit me to copy from the cover of the book (back and side) its title, "*Airmen* o' War."

Women of Courage.

According to the "Daily Mail," " to show America that England also possesses women of courage," Miss Violet Lay, of 78, Bridge Road, Litherland, near Liverpool, has joined Miss Denbigh in an offer to attempt the Atlantic flight in opposition to Miss Ruth Law, the American airwoman.

"I would not stop at the thoughts of grief in drowning," Miss Lay writes, "and I do not think the instructors would find us very troublesome, both being very daring and interested in machinery."

If the lady does "not intend to stop at the thoughts of grief in drowning," one hesitates to throw cold water on her ambition. One would like to know, however, if the last sentence means that the ladies or the instructors are very daring.

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The WORLD of AERONAUTICS (continued)

A Forbidden Amusement.

An order has been issued by the Air Ministry forbidding personnel of the Women's Air Force attending boxing contests arranged by the R.A.F. The order states that boxing "is not considered a suitable sport for women." It is true that there are other sports more suitable and charming for women, but if boxing is an undesirable spectacle for women then it must be equally so for many of the men left to us by the great war.

Also, one has heard of black eyes and abrasions caused in rows among the W.R.A.F.s, so why not let them learn the gentle art of self-defence?

General Seely at Bisley.

Entries for the Bisley meeting, July 9th-19th, are now being received. The R.A.F. will be strongly represented, and Major-General the Right Hon. J. E. B. Seely, C.B., C.M.G., D.S.O., has entered for the King's Prize.

Parachute Experiments.

Some tests were carried out on June 6th at Kenley Aerodrome, Surrey, with a parachute designed by Major Taylor, R.A.F. This parachute, Major Taylor claims, is smaller, lighter, and can be stowed in a smaller space than any type already in existence. The following comparison is given by an observer of the tests :—

Major Taylor's type, rate of fall, 13 ft. per sec.

A commercial parachute (type unstated), rate of fall, 15 ft. per sec.

An experimental R.A.F. type, rate of fall 20 ft. per sec.

The Women's Height Record.

On June 6th Madame de la Roche, flying a small Caudron biplane, beat the women's height record. The flight lasted one hour and forty-nine minutes, and the height attained was 12,796 feet

The Right Kind of Enterprise.

The War Department of the United States has completed plans for a flight from New York to San Francisco, a distance of 2,760 miles. One stop will be made at North Platte, Nebraska, 1,500 miles on the way. The machine will be a Wright bomber, and will be piloted by Capt. R. H. Francis, with a Lieutenant as mechanician. The flight is expected to start soon.

A Missing Aviator.

On May 27th Capt. Mansell James, D.F.C., a Canadian, who had served in the R.A.F. during the war, flew in a competition (the terms of which are not known) from Atlantic City, New Jersey, to Boston, Massachusetts, a distance of 340 miles in 3 hrs. 27 mins. His aeroplane was a Sopwith Camel. For this flight he received £1,000 and other smaller prizes. On the same day he began the return journey but lost his way and was forced to land at Stockbridge, Mass. Two days later he left this place for Mineola, New York, his route passing over great stretches of mountainous and wooded country, as well as over Long Island Sound. He was last seen flying over Winchester, Connecticut. From that time nothing whatever has been heard of him, despite the efforts of innumerable search parties. It is possible that he flew out to sea by mistake and was drowned.

Polar Exploration by Aeroplane.

M. Stefansson, the explorer, has paid a visit to Mr. Orville Wright at Dayton, Ohio, for the purpose of discussing the possibility of using aeroplanes in the Polar regions.

M. Stefansson declared he believed it possible to construct a special type of aeroplane that would carry a party of explorers. He intends, if satisfactory arrangements can be made, to attempt such a trip this year or early next year.

Good as has been Mr. Orville Wright's work for aviation in the past, he can scarcely be considered an authority on Arctic aviation. Mr. Stefansson had better apply to the O.C. R.A.F., Archangel, for advice.

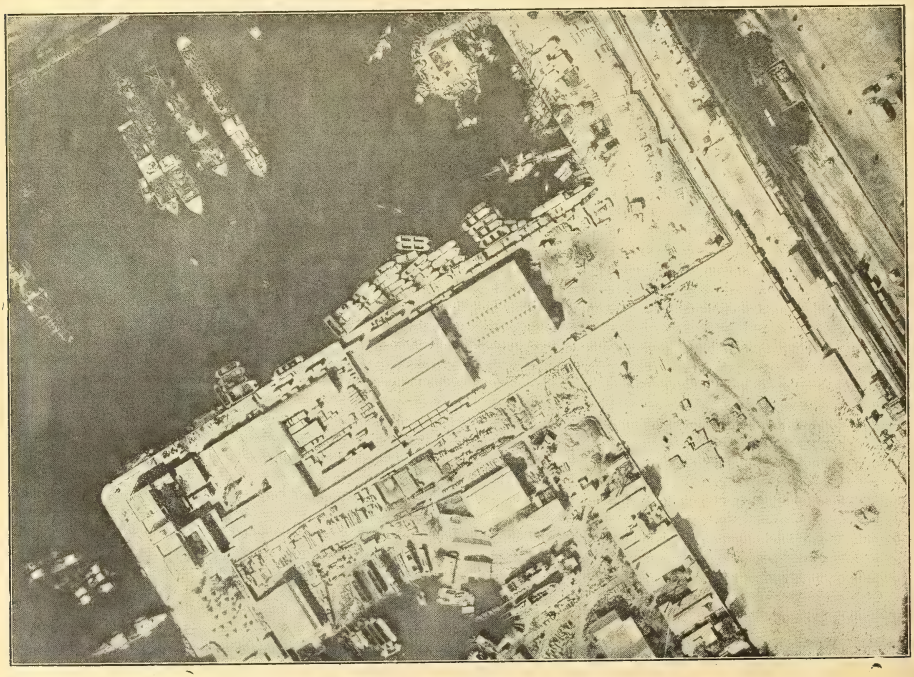
A Tragedy.

A message from Newhaven, U.S.A., states that Lieut. Kelleher, of the United States Army, and Mechanician J. Katzman fell 1,000 ft. to-day, and were killed.

Their aeroplane had been in collision with another machine piloted by Corporal Kelleher, the Lieutenant's brother. The latter succeeded in planing down safely.

A Move from the Hotel Cecil.

The Controller of Information, Civil Aviation Department, Air Ministry, has removed from the Hotel Cecil to India House, Kingsway, where his Department is located on the fifth floor. All Press inquiries should be addressed to the Publicity Branch, Room 549. The telephone number is "Holborn 2951, extension 121."

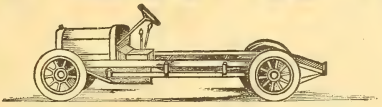


The Harbour, Port Said, photographed by a German Aviator.

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The WORLD of AERONAUTICS (continued)

59 Squadron's Dinner.

Will all those who were not at the Café Victory on May 24th, write immediately to Captain Oliver, R.A.F., Thrale Hall, Streatham, S.W.?

The Blood-Lust of Leeds.

"Hear all, see all, say nowt,
Eat all, drink all, pay nowt,
And if thou dost owt for nowt,
Do it for the'sen."

YORKSHIREMAN'S MOTTO.

And if we transpose the words "pay" and "say," we have the attitude of the typical Yorkshireman at the R.A.F. exhibition at Leeds. For, indeed, they do hear all, see all, or very nearly, and pay completely nowt.

They flock in their thousands to the gates of the show, but do you think that they would pay a bob to go inside? Not a bit of it! They can watch the flying very comfortably from the pleasaunces of Roundhay Park. They would expend hundreds of shillings on a merry-go-round or at a cocoanut shy, but for the charities of the R.A.F., the idea is definitely humorous.

The Mayor of Leeds graced the opening ceremony. Whether he was arrayed in his robes and chains I was not there to see, but it was a very hot day. And then a General and a Peer flew away from it and crashed, and with these inducements for a really jolly time the gates were open for the expectant crowd.

But the wily Yorkshireman is not caught as easily as that. He does not go to see Fokkers, or different makes of engines, or guns, or the various things that contributed to keep him safe in bed o' nights. He goes to see the flying, and to pray for an accident. In this respect the Yorkshireman is not only to blame. For many months I was stationed at an aerodrome near London, and at week-ends the ground was black with eager searchers after thrills and blood.

And it was with much will-power that I restrained myself from machine-gunning them when they were busy pulling souvenirs from a machine, under which a friend of mine lay dead.

There is something irresistibly funny in the spectacle of a man being killed, especially if the amusement is gratis and without danger to oneself.

The trouble at Leeds is, that the show is not sufficiently advertised. Instead of a modest poster announcing that the R.A.F. exhibition is now open, the streets should be decorated with striking phrases.

"Deaths daily," "Sensational suicides," "Blood by the Bucket" should appeal to the crowd's sense of the romantic, and it might be persuaded to pay for such fun.

But, of course, a shilling is a lot of money.

LONDONER.

Misleading Statements.

The following letter appeared in the "Times":—

Sir,—After reading your admirably full account of General Seely's speech on the occasion of the luncheon given to the N.C.4 airmen, I am left with the feeling that his remarks, as far as they concern practical flying in this country, are hopelessly misleading.

I do not wish to labour the point or to criticise his speech at length, but his remark stating that landing fields should be 400 yards long, or, if smaller, that the pilot should be of superhuman skill, is absolutely ridiculous. To begin with, he makes no distinction in the types of machines and the relative size of landing grounds necessary for each type. In the second place, his estimate of 400 yards is altogether inaccurate for many types. As an instance of this, I should like to point out that, during the flying to the Derby organised by me, my five pilots and myself used a field which was only just 150 yards long and about 100 yards wide. The fact that 30 trips were made to and from this ground with full load, consisting of five persons, on some practically standard Avros, shows that for pilots of ordinary first-class skill this size field presents no difficulty. Not one of us claims to have superhuman skill, or anything like it, but we should like to be exempted from the restrictive regulations imposed by the Air Ministry about which I could discourse to you at length.

I do not write this letter from the point of view of self-advertisement, but I greatly deplore the attitude of General Seely in making out that severe difficulties and dangers attend civilian flying. I maintain that with proper selection of pilots the dangers are practically non-existent, and I firmly believe that with this test, if strictly carried out, 90 per cent. of the risks will be eliminated, and I appeal to you to endeavour to advance the cause of civilian aviation by ventilating certain grievances, with which I can acquaint you further if you are interested.—Yours faithfully,

G. L. P. HENDERSON, Lieut.-Colonel.

6, Cambridge Square, Hyde Park, W.2, June 6th.

A Volunteer Reserve Air Force.

The following letter has been received:—

Sir,—I think the suggested formation of a Volunteer Reserve Air Force is by far the best scheme that has ever been proposed by an aeronautical publication. Undoubtedly, the time is ripe for this. The country owns thousands of machines which will be scrapped unless something is done to stop the sinful waste of reducing to produce, which means junk, machines of the latest type which have cost the country millions of pounds.

The aerodromes are also available; all that is needed is Governmental encouragement. I have discussed the scheme with dozens of demobilised officers, and without exception they are keen on the idea. I am sure if we are given a lead thousands will flock to such a Reserve, and those who join will be the right type—fellows who have real enthusiasm and who will jump at the opportunity of keeping their knowledge of aeronautics up to date. In addition, we should obtain a large number of recruits who will welcome the opportunity of instruction in flying, and in the technical branches that the Reserve will offer.

Incidentally, the scheme will assist in the development of commercial aviation, because the Reserve will bring to light ability that would by no other means be disclosed. As time goes on, and many of the recruits become skilled, they will endeavour to find employment in commercial aviation and will remain in the Reserve, ready trained for service in the event of war.

To the better class youths of Britain aviation makes a strong appeal to-day. The Reserve would give them the opportunity they desire. We have highly trained and experienced ex-officers of all branches who would, I feel sure, gladly give a reasonable proportion of their time to the duties of instructing the recruits.

It is essential, however, that the proposed Reserve should be formed at once, for every day's delay means that more serviceable machines will be broken up. Surely the country can be made to realise that a properly established Reserve Air Force would be of incalculable value from every possible point of view.

WINGS.

[Correspondence on the subject will be welcome.—ED.]

The Aerial Derby.

The race round London, commonly known as the Aerial Derby, will be flown on Saturday afternoon, June 21st next. The race is being organised under the auspices of the Royal Aero Club by the Directors of the Grahame-White Co., Ltd., of the London Aerodrome, Hendon, N.W., where the contest will start and finish.

The prizes, which are valued at over £1,100, are as follows:—

FASTEST TIME.

Winner.—"Daily Mail" Gold Trophy (value 200 guineas) and the "Shell" Prize of 500 sovs.

Second.—"Shell" Trophy and "Shell" Prize of 100 sovs.

SEALED HANDICAP.

Winner.—"Shell" Trophy and "Shell" Prize of 100 sovs.

Second.—"Shell" Trophy and "Shell" Prize of 50 sovs.

Third.—"Shell" Trophy and "Shell" Prize of 25 sovs.

The whole of the cash prizes, amounting to £775, have been **presented by the "Shell" Marketing Co., Ltd. (distributors of "Shell Motor" and "Shell Aviation" Spirit).**

This is the fourth occasion on which this contest has taken place, the last being on June 6th, 1914.

The 1914 course, which covered a distance of approximately 95 miles, with six turning points, will be retained, but, owing to the improvement in the speeds of aircraft during the war period, it has been decided that the course shall, on this occasion, cover a double circuit, instead of a single one as hitherto, a total distance of **approximately 190 miles.**

The race was first held in 1912, when Mr. T. Sopwith was the winner on a 70 h.p. Blériot monoplane, his average speed being 59 miles per hour. In 1913, Mr. Gustav Hamel, on an 80 h.p. Morane monoplane, won at a speed of 76 miles per hour, and the winner of the 1914 contest was Mr. W. L. Brock, an American **pilot, on an 80 h.p. Morane monoplane, at 72 miles per hour.**

The competitors will start at 3.30 p.m., turning at Kempton Park, Epsom, West Thurrock, Epping and Hertford, passing over the Hendon Aerodrome, and entering the second circuit at **about 4.10 p.m. The winner is expected to finish at Hendon,** after completing the second circuit, soon after 4.45 p.m.

In order to give the slower machines an opportunity of participating in the prize-money, a sealed handicap has been included. The special "Shell" trophies and prizes for the Sealed Handicap will be awarded to the three competitors who shall have completed the course in the fastest respective handicap times.

The winner of the aerial Derby itself shall be the pilot who is the first to cross the finishing line in flight, after having properly completed the double circuit of the course.

The entry list is now open, and pilots and manufacturers may obtain entry forms, regulations and map of course, from the Secretary, the Grahame-White Co., Ltd., London Aerodrome, **Hendon, N.W. Entries close at 12 noon on Saturday, June 14th.**

The entrance fee is £10, which will be refunded to all competitors completing the course, and half of the entrance fee will be refunded to all competitors starting but failing to finish.

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Before the fateful days of 1914 Beardmore had made History.

Record upon Record was created by this Masterpiece of Aero : : Engineering : :

BEARDMORE WAS READY when the avalanche of war broke upon the World and HELPED MOST WHEN THE NEED : : WAS GREATEST : :

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C.D.C.

PARIS NOTES

The Tour de France Aerien.

From time to time reference has been made to the Tour de France Aérien, which is to be held from August 24th to 31st, and for which prizes amounting to 100,000 francs are offered, and one has now to record the fact that the first three entrants are Navarre, Bourgeois, and Fronval, all on Morane-Saulnier machines, two-seater parasol type, fitted with 80-h.p. Le Rhône engines. These machines would seem to be eminently suitable when it is considered that the competition is primarily a touring one, and that at least one passenger must be carried.

The Farman "Mosquito."

Bossoutrot must be one of the most versatile pilots. With a war "reception" record of the highest, he is now normally employed in flying the big Goliath machine with its human freight from Paris and Brussels and return weekly, but he fills in the 'tween-whiles by flying of a lighter variety. Thus, one morning last week, at 8.45 a.m., he took up a little machine of 12 ft. span, called the "Moustique," and climbed to 4,500 ft., returning to earth an hour later. On getting out of the cockpit he took the tail of the machine over his shoulder and dragged it to the hangar. The "Mosquito" is fitted with a 20-h.p. horizontally opposed twin-cylindered A.B.C., is a single-seater, and weighs 100 kilos. It cannot strictly be called a new design, having been tried and flown over a year ago, but till now it has not been produced in quantities.

The Voisin "Aerochir."

Some weeks back a description and photographs of this type of aerial hospital ambulance were given, the disposition of the surgical plant having been designed by M. Neminovski and Dr. Tilmant. The trials being good and the design in general approved by the French War Office, a more elaborate affair has been designed. This new type of aerochir is a Voisin biplane with wings that fold back, fitted with four motors and four airscrews capable of sustaining a useful load of 2,500 kilos and of flying six hours non-stop. The interior disposition of apparatus is designed for the following use:—On the outward journey, to carry a medical or surgical staff of five plus the instruments and impedimenta, including a Rontgen-ray outfit, and also a tent which can be "inflated" in a few minutes, and in which a constant temperature can be maintained, which is of great value in tropical climes where the heat of the day is succeeded by the cold of the night. On its return and subsequent journeys the machine is so arranged that it can transport four wounded "lying" cases and four wounded "sitting" cases. Thus on each journey eight wounded can be carried under the care of an attendant and, of course, the pilot.

French Aeronautics and the French Budget.

The Treasury here has got in a muddle over the aeronautical credits. In the budget of the second quarter of 1919 £44,000 was asked for in order that certain payments might be made. This was afterwards reduced to £22,000. The latter sum, however, was insufficient to pay even the wages of the personnel, therefore the Ministry has had to ask for a supplementary credit of £16,500.

In addition to this, there is an amount of £104,000 for the sending of aeronautical missions abroad—to Turkey and the Argentine in particular—for which an extra credit of £52,000 is asked. This is to be divided as £48,000 for the mission to Turkey and £4,000 for the mission to the Argentine.

Aviation in Morocco.

The Senatorial Commission which looks after North African affairs had a few words to say apropos of the development of aviation in their protectorates. M. du Vivier de Streel showed that military aviation in Morocco facilitated military operations, was a valuable aid to the sanitary service, an asset to the map-makers, and had taken valuable photographs of country that was until then unknown. In Algeria, aviation, helped by the Army Automobile Section, had contributed to the future prosperity of trans-Saharan enterprises. In closing, M. Flandrin announced the establishment of a postal service between Algeciras and Rabat.

It is probable that Morocco will have the most complete service of aerial posts in the world in a very short time. Within the next three months 154 Breguet machines are to leave Paris for Casablanca by way of the air, with the probability, if they arrive safely, of another 50 being sent. These machines will be employed on communication work between the big coastal towns and the interior. It will be no mean achievement to transport these 150-200 machines by air, and the whole affair has been entrusted to Lieut. Villier of the Société des Grands Express Aeriens. Adjt. Papeil, an old reception pilot of nearly 3,000 flying hours, is in charge of the exploit.

La Ligue Aeronautique de France.

By special permission of General Duval, Count de la Vaulx, vice-president of the French Aero Club, was allowed to travel from Paris to Nancy by air in order to hold a conference on the work of the League in the past and its programme in the future, in view of the probable development of commercial aeronautics. Count de la Vaulx chose an S.A.E. machine with a 350-h.p. Lorraine Dietrich and piloted by Lieut. Romanet.

Visitors to Paris.

A visitor last week of great interest in the aeronautical world here was that of Capt. Barber, technical adviser and director of the Aviation Insurance Association of London. It is satisfactory to note the amount of interest displayed here in the terms of insurance by this Association, because no company here can compete with it, and it looks more than probable that they will secure the adherance of the Industry here in a similar way to that in which Lloyd's secured their world-wide shipping insurance.

Lieut. Louis Noel, in mufti, was also met on the Boulevards, on his way to the Balkans. It is not certain whether he will return to Hendon or not.

Another Attempt on the Height Record.

Capt. Fonck made two attempts during the past week to beat the height record set up by Lieut. Casale. The first failed owing to trouble with his sparking plugs, and the second owing to the lubricating oil freezing at 29,250 ft. The attempt took an hour and a quarter, starting from Issy and landing at Toussus. Meantime Lieut. Casale announces his attention of attempting to beat his own record of 30,200 ft.

Europe—Africa—South America.

Lieuts. Lemaitre, Roget, Fontan, and Marchal share between them the honours for attempting to fly from Paris to Dakar and thence to Pernambuco. Capt. Marchal, who was the first to conceive the idea, and to whom permission was given by the French War Ministry as far back as May, 1918, is the latest to announce his intention of attempting this arduous trip. His great ambition is to be the first to cross the Atlantic without a stop. Lieut. Fontan left Villacoublay on June 8th at 4.15 a.m. en route for Dakar. He was forced later to land in the Sierra de Moncaya as a result of engine trouble.

The Generosity of Poulet.

The French aviator, Etienne Poulet, has decided to reserve a large proportion of the money earned by him in the way of prizes, or fees for passenger-flying or exhibitions, for the benefit of the four children, aged three, five, seven, and nine, of Jules Vedrines. Poulet is a member of the committee of the League of Pilots, and at one time held the record for a non-stop flight of 16 hours 20 minutes. He has been doing a lot of flying lately on a Caudron-Rhone machine, type 21, as training for an attempt in the near future on the distance record.

Paris-Brussels Service.

The regularity with which the Goliath completes this double journey and the immunity which it has hitherto enjoyed is greatly appreciated by all circles here, and there would consequently seem to be no lack of passengers. Incidentally it is Mr. Dick Farman's intention to advertise these services on a wide scale in the near future. Up till now all the passengers have been secured by means of tickets left with the leading hotels and touring agencies.

Swiss News.

From Zurich comes news that Bider and Wild are founding an aerial touring company with the intention of establishing aviation stations at all the Swiss health resorts. Hydro-aeroplanes are to be employed, consequently most of the stations will be on the lakes, although a few land machines will be employed for special flights, particularly those of longer duration Lausanne, Lucerne, Lugano, Geneva, Thunn, Interlaken, and Zurich have been selected as a beginning, although it is probable that Locarno, St. Moritz, and Montreux will be also included.

The capital of the company is £60,000. They expect a loss in the first year's working, reckoning that the income will be about £40,000 and the expenses £48,000. The life of the machines is calculated as two years, or 500 flying hours.

The postal aeroplane on the Dubendorf-Berne-Lausanne and return route has been placed at the disposition of the public. The journey as indicated above is divided into two stages, and the fares are to be 100 francs per stage, or 300 francs for the whole journey.

It is announced that the man who found the body of Capt. Palli has also found his machine, although no details are to hand as to its state or the documents which are supposed to be with it.

Tadeoli, a Swiss aviator, working as pilot with an Italian firm during the war, is leaving his hydroaeroplane establishment on the Lac Majeur and proposes to establishes a similar establishment on the banks of the Geneva Lake.

F. T. N.

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Nothing can be better than "Cellon"
Therefore "Cellon" is the best.

The above is a self-evident truth which requires no proof; Nevertheless:

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THE TRANS-ATLANTIC COMPETITION.

A NOTABLE GATHERING.

On June 5th at the House of Commons, Major-General the Right Hon. J. E. B. Seely, C.B., C.M.G., D.S.O., Under Secretary of State for Air, gave a Luncheon in honour of the crews of the American Flying-boats which crossed the Atlantic.

The Luncheon was honoured by the presence of H.R.H. the Prince of Wales, K.G., who, in replying to the toast of his health, expressed briefly his keen interest in aviation and the pleasure which it gave him to meet so many distinguished flying people. He congratulated the American Naval Officers on their achievement.

General Seely proposed the toast of the hero of the trans-Atlantic flight, Lieut.-Commander Read, U.S. Navy, and assured him that British aviators felt no trace of envy at his success—a sentiment which was loudly applauded.

General Seely pointed out that many of our most distinguished aviators were present there to greet Commander Read. Lieut.-Commander Grieve was with them, and he regretted that Mr. Hawker was so overcome by the receptions which he had had since his return that he was unable to be present. Among the others there were Lieut.-Col. Beatty, who had recently had breakfast in Madrid and tea in London. There was Major Leslie, the hero of one of the great flights from London to Constantinople. There was Col. Porte, who led the world in the design of flying-boats. There was General Maitland, of the Airship Department, who had recently spent 21¾ hours in the air, and who hoped before long to visit another country across the sea by airship. There was also a distinguished Italian aviator, Count Zapola, one of the few survivors of Major Gabriele d'Annunzio's famous flight to Vienna.

Continuing, General Seely said that there was a great deal to be done in the development of aviation. There was a great deal for the Government to do and a great deal for the constructors to do, and he would indicate a few things to be done. Aerial navigators wanted vertical beams from our existing lighthouses, but Trinity House said that this was difficult to achieve. More landing grounds were required. Lord-Lieutenants of Counties and Chairmen of County Councils could do much to develop local landing grounds, and thus would help to save many lives. Railway Companies could assist by painting the names of their stations on the roofs, thus indicating their whereabouts to aviators and saving them from disaster. Better telephone communications were required between aerodromes, so that when an aviator left one aerodrome for another the aerodrome to which he was flying and those along his route could signal to him as he flew.

The Government was doing all that it could to help and it had handed over the whole Department of Meteorology to the Air Ministry, and all meteorological observations would be at the disposal of aviators. He (General Seely) wanted more safety, more comfort, and more economy in aeroplanes. Recently, in the House of Commons, he had announced some rather startling figures for the fatalities since the Armistice, but he wished to point out that these figures only represented one fatal accident for every 43,000 miles flown. Many of these accidents were quite avoidable. He said that we must have slower landing speeds for aeroplanes, for just a quarter of the fatal accidents which had occurred were due to forced landings. Ten per cent. of the accidents were due to fire—an altogether avoidable cause. Many fatal accidents were caused by propellers when starting up engines, and these accidents should be wholly avoidable. The whole of the Government's experiments were at the disposal of the Industry.

General Seely emphasised the fact that the Air Ministry had effected more economies since the Armistice than any other Government Department, but he could assure everybody that money would not be lacking when it could be spent in minimising the risk of flying

Lieut.-Commander Read, in replying, said that he did want to say how deeply he appreciated the wonderful welcome which the American aviators had received in this country. He much appreciated the honour of meeting H.R.H. the Prince of Wales, who, he believed, was quite a flier, judging by the pictures in the papers.

The trans-Atlantic flight, he said, was quite a Navy show, and had been organised altogether by the U.S. Navy. The execution of it was a very simple proposition, and he and his crew were very fortunate in being chosen to take part in the flight and were very lucky to get through. He expressed his surprise at the reception which had been given them on arriving in London from Plymouth. They had always heard that Sunday afternoon in London was a very quiet affair, but he judged differently from his experience last Sunday.

He said he would like to congratulate the British people on their sportsmanship. The British were good winners but they were wonderful losers.

After these comparatively brief speeches the company adjourned to the Terrace of the House of Commons, where a kind of informal conversazione was held. One noticed among those present —Mr. Winston Churchill, General Trenchard, General Brooke-Popham, General Swinton, Lord Montagu of Beaulieu, General Holden, General Ruck and the heads of practically all the leading firms in the Aircraft Industry.—C. G. G.



Mr. F. P. Raynham and his Martinsyde just after she was unpacked at Quidi Vidi. This is believed to be the only occasion on which Mr. Raynham has been caught by a photographer.

HONOURS FOR AMERICAN AVIATORS.

On June 9th, Major-General Seely, Under Secretary for the Air, on behalf of the King, decorated Commander John Towers, O.C. the N.C. Squadron, U.S. Navy, for the American trip, and Lieut.-Commander Read and the four officers of the American seaplane N.C.4 with the ribbon of the Air Force Cross.

The officers who accompanied Commander Read were Lieutenants Hinton, Stone, Rodd, and Breeze. Chief Mechanic Rhoads was also decorated with the Air Force Medal. Major-General Sir Hugh Trenchard, Chief of the Air Staff, and Major-General Swinton, Controller of Information, Air Ministry, were with General Seely.

In making the presentation General Seely told the American aviators that he had been especially charged by the King to perform the ceremony and to inform them that His Majesty was extremely proud of the fact that they had accomplished the flight not only across the Atlantic, but had also completed the trip to England. There had been only two other recipients of the Air Force Cross, Mr. Hawker and Commander Grieve, and he explained that this Cross was a new decoration. He regretted that he was unable at the moment to decorate them with the Cross itself, but could only pin the ribbon on their breasts. As soon as the Crosses were struck they would be forwarded to them in America. He congratulated them personally on the success of their venture.

In decorating Chief Mechanic Rhoads, General Seely said that the King had asked him to refer specially to him and congratulate him on the work which he had done. It was largely due to his industry, he said, that the expedition was such a success.

The ceremony took place at the Air Ministry. President Wilson had given special permission for the officers to wear the decorations bestowed upon them.

The award seems very apposite, as Service decorations are fitly bestowed on officers of friendly nations. One regrets, however, that the King himself did not make the presentation.

OTHER COMPETITORS.

There has been very little news of the Atlantic Flight competitors during the past week. It appears certain now that Lieut. C. H. Biddlecombe, R.A.F., will take Capt. Morgan's place as navigator to Mr. Raynham's Martinsyde. He is a master mariner and a pilot, and has already sailed for St. John's, Newfoundland.

On June 9th the Vickers Vimy aeroplane ascended for a test flight of about 40 minutes' duration. The crew reported everything was satisfactory.

It appears probable that the Handley Page and Vickers machines will be the two to start on the second attempt to

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K·L·G PLUGS

for the TRANS-ATLANTIC FLIGHT
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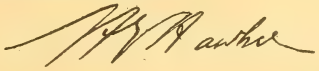
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cross the Atlantic, as the Martinsyde cannot be got ready for another ten days or so.

The Airship Attempt.

Apparently R.34 will really make an attempt to cross from England to America within the next few weeks. There is some talk of a start during the coming week, and it is also said that General Pershing will make the voyage in her.

Major C. H. Scott, R.A.F., has been appointed in command of R.34.

Final preparations are being made, and a special squad of R.A.F. mechanics under Major Fuller left this country by steamer on Friday last for Atlantic City, to be ready for the giant aerial vessel's arrival there.

The American News.

It is announced that N.C.4 will not attempt to fly back to the United States, but will be dismantled and shipped.

Lieut. Locklear, the American aviator, who has lately performed several unnecessary and dangerous "stunts," having resigned his commission in the U.S.Army Air Service, has announced his intention of competing for the £10,000 prize. He will attempt the non-stop flight from Newfoundland to Ireland.

AT THE OTHER END OF THE ATLANTIC COURSE.

By "One on the Spot."

It is a great pity you have not been with the Sopwith and Martinsyde expeditions in St. John's, for you would have seen flying in one of Nature's most sanguinary settings; and it is a greater pity your pen cannot describe the sight of Hawker and Grieve slipping away over the signal tower at the harbour mouth in a sporting effort to beat the Yanks to it. I think the stoutness of the attempt is just beginning to sink into our consciousness now.

I doubt very much whether Grieve or Morgan felt satisfied with the weather on May 18th, but they were not in any ignorance of conditions so far as Clements (Lieut. L. J., R.A.F.) could extract them from all his sources of supply. Clements worked night and day for the fliers, and Grieve helped him at times in deciding moot points. If there is any fault to be found, it is with the forecasts from the other side.

And I think we are all rather proud, without saying so, in the knowledge that neither Hawker nor Raynham had much thought of the *Daily Mail* prize when they decided to take a chance. They were out to get across before the Yankee seaplanes. If any of our own four had any doubts of the venture, not one showed them. Really I believe they were glad to get away on any pretext. The waiting here has been dreadfully trying, and it told on the two crews more or less; they were pretty jumpy at times.

The flying fields were enough to give anyone the creeps when it was remembered that the machines would have to stagger off with a heavier load than anything of their fighting weight has had to carry since the world began. Half a day's rain made Hawker's place a swamp, and he only had a fair run when the wind was north-east or south-west. A forced landing anywhere for miles meant a certain crash, probably fatal.

Fog and rain shut everyone in for the best part of a month. Then, when the Atlantic weather cleared, the local fogs descended or the winds blew from a quarter which gave no room to taxi in. Fair winds here were only echoes of storms in the Atlantic.

It was a constant case of hope deferred making the heart sick, with the Yanks running their Cook's tour, personally conducted by the whole destroyer fleet, from Rockaway to the Azores, and the only favourable breezes scratching their American backs. The Eagle was screaming in the local hotels here from morning until night during the procession from Rockaway to Trepassey, and it was very strongly hinted that all the Britishers had cold feet. The correspondents began by battling with Hawker, and continued by roasting him for his personal peculiarities, but fortunately were away for the start, their train from Trepassey being delayed.

The New York scribe has not the slightest understanding of the Briton, nor the Briton of him. To illustrate: a N.Y. "Times" man asked me and some others yesterday whether Grieve had left any "farewell message."

Raynham and Morgan had to take the chance of crashing or staying behind on Sunday. Their field was a narrow strip of hard ground near a large pond. Between them and the sea, in the line of their natural take-off, is a line of cliffs about 300 feet high, with intervening streams, scrub trees and rocks. It was a case of run down wind for it or stay home.

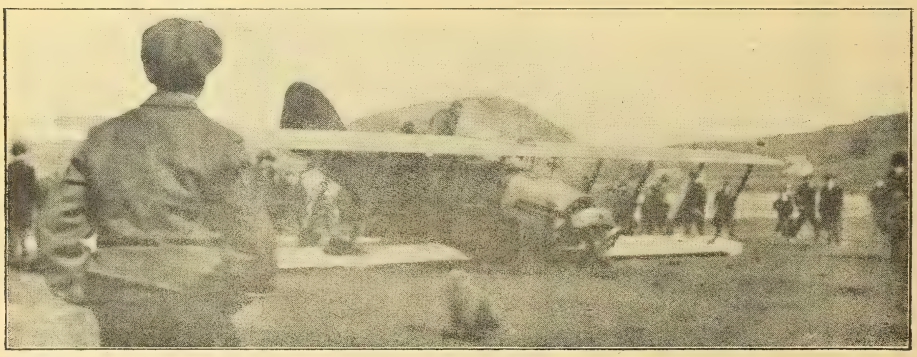
The Martinsyde machine waited a whole hour, hoping for a shift, which sometimes happens in local winds very quickly in the late afternoon. Her engine was singing very prettily, and there was no fault in his technique when Raynham taxied off. The weight was telling very severely, and I do not think his plane ever approached flying speed before it crashed, although another twenty yards probably might have done the trick. Passing over some bumps, the machine hopped twice a few feet in the air, certainly not more than three. Then the undercarriage folded up, and that was the end of their attempt.

Nothing but God's Mercy prevented a tragedy, for the tanks burst, and the ground, the machine, Morgan, Raynham, and half of St. John's were soaked with petrol. Raynham got hit by the joy-stick and his eye was cut a bit. Morgan's gammy leg got jammed, and his other one was bruised; his left eye was cut, and he had a long gash in his left cheek. Both of them were groggy for a minute or two, and would make no effort to get out. Then someone pulled Morgan out, and Raynham managed to make it on his own.

You can imagine the crowd all this time. St. John's had never seen a crash before. Pipes, cigarette ends, but fortunately no lighted matches, began dropping into the area of petrol, and fist fights started when forcible methods were used to stop the smoking. However, all ended well. Morgan did a quiet faint and was put away in bed. Raynham stuck to the job of getting the 'bus back into the hangar, then washed his face and came home to supper.

I have never seen a chap take a disappointment in a more sporting way. The doctor here has put his foot down on Morgan as a flier and is sending him home by the "Corsican." Raynham says he will rebuild and try again with another navigator. I wish him luck, but he has a hard job ahead of him.

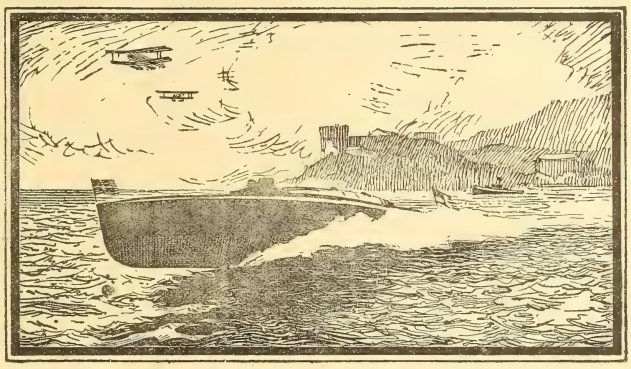
St. John's was very much upset over the news or lack of news of the Sopwith crew. No native has left anything undone to help, and the main drawback is the country, which is, as I said before, sanguinary, except in the one spot the H.P. crowd have selected.



Mr. Raynham's smash at Quidi Vidi when starting on an attempt to fly the Atlantic. His passenger, Captain Morgan, is seen being helped from the machine.

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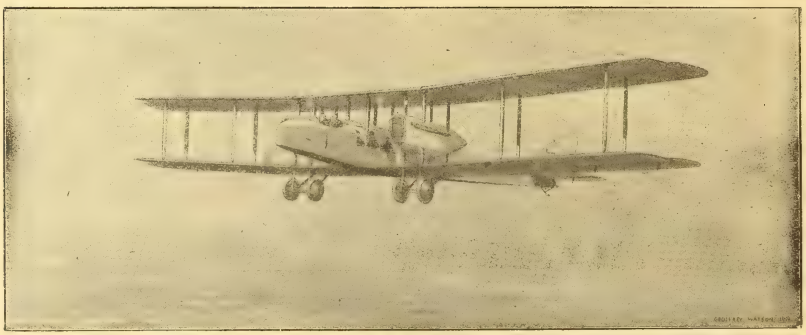
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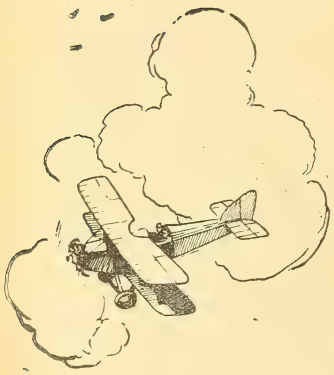
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THE WEEKLY COMMENTARY.

A description of the "Holt" compound parachute system as applied to aerial life-saving appears on page 2349.

An article by Capt. Sayers on the development of the aero-engine begins in this issue.

This article maintains that the whole course of development of the aero-engine up to date has been dictated primarily by the demand for higher performances on the part of aeroplanes, with reliability and economy as quite secondary considerations. As a result, aero-engines are consistently run at a load approaching that of breakdown, and cannot be considered as reasonably reliable.

The characterisation of one large class of modern engines as respectable descendants of a motor-car ancestor, "covered with gadgets," if perhaps scathing, has some truth behind it.

The description of aeroplanes designed and built by Wm. Beardmore, Ltd., forming part of the series on Modern British Aeroplanes, is concluded in this issue.

A description of the passenger-carrying machine designed by Vickers, Ltd., is given in this number. The type of construction used for the passenger cabin is of interest.

The adoption of interchangeable fuselages whereby a standard machine may be modified to suit various purposes is a novel feature. This type of machine made its first public appearance at Hendon on Saturday, May 31st, where it attracted considerable attention.

THE DEVELOPMENT OF THE AERO-ENGINE, PAST AND FUTURE.

By Capt. W. H. SAYERS, late R.A.F.

The development of the aeroplane has always waited upon the development of its source of motive power. Had there been in existence 50 years ago any prime mover capable of developing 1 h.p. for even 10 mins. for a total weight, including fuel, of 5 lbs., it is more than likely that mechanical flight would have been an accomplished fact 45 years ago.

In actual fact it became possible only in 1903, when Mr. Thomas Manley designed and built for Samuel Pierpont Langley a 5-cylinder radial petrol engine which actually developed 50 h.p. for under 200 lbs. weight. By a series of misadventures this engine never took the air till in 1914 Glenn H. Curtiss flew the Langley machine for which it was built with the original engine.

A little later the Wright brothers, having practically solved the whole of the basic aerodynamic problems of flight, and practised the art by gliding downhill, had to develop their own engine before the power-propelled Wright biplane could be made to fly.

From those days to the present is but a very short time, as time goes, but in the development of dynamic flight it has covered a phenomenal advance.

The Rate of Progress.

The rate of this advance has been determined almost entirely by the progress of aero-engine design, and it has been entirely an advance in the direction of increased maximum performance on the part of the aeroplane and engine combined.

To take the matter back no farther than 1912, at which date the general trend of aeroplane design had settled down to lines from which it has yet to depart, it will be found that the best available aero-engine, considering possible performance alone, was the Gnôme of 50, 70, or 80 nominal h.p., whose bare weight varied from 4 to 3½ lbs. per b.h.p. These engines were extravagant as to fuel and oil consumption, but, as long-duration flights were in small demand, they almost invariably beat their more economical but initially heavier competitors.

At that date a machine with a top speed of 65 m.p.h. and a climb to 5,000 ft. in 15 mins. would have been a phenomenon.

The Results of the Present Day.

To-day, air-cooled engines up to 500 h.p. each, at 1.7 lbs. per h.p., with quite low fuel and oil consumptions, are available for high-performance machines for moderate durations of flight, and, for cases where longer ranges are required, there are water-cooled engines of anything up to 700 h.p., weighing, with water and radiators, less than 3 lbs. per b.h.p., which regain some, at least, of the handicap of their initially greater weight through their lower fuel consumption, and which have a reputation for reliability superior to that of the air-cooled type.

Whether this reputation for superior reliability will be long retained is at present open to doubt.

With this increase in the size of power units, and the decrease in the specific weight per h.p. of the power unit, the performance of the aeroplane has advanced, and to-day 130 m.p.h. and a climb to 15,000 ft. in 15 mins. will cause less astonishment than would 65 m.p.h. and 5,000 ft. in a quarter of an hour seven years ago.

Notwithstanding the great reduction of the weight per h.p. which has been attained in the modern engine, reliability and economy have distinctly improved.

Nevertheless, the aero-engine of to-day cannot be regarded as a reasonably reliable piece of machinery. It cannot be compared in this respect to the common or garden motor-'bus engine, and the commercial future of aviation must depend upon improvement in the re-

liability of aero-engines, just as the very existence of the aeroplane in the past has depended upon the improvement of the weight/h.p. ratio.

The possibilities for the future must be considered in the light of the experiences of the past.

An examination of the underlying causes for the particular lines of development which have led to the present aero-engine will show that the main impulse to progress has been the need for higher and still higher performance on the part of the aeroplane, and therefore for lower weight per h.p. on the part of the engine.

In the earlier days, up to 1911 or thereabouts, it was a question of obtaining an engine sufficiently light and powerful to fly a machine at all.

Between this period and August, 1914, better and better performance was needed simply to make the aeroplane reasonably independent of the normal vagaries of the wind, and from the outbreak of war till almost the present time the military necessities of aerial warfare have intensified the demand for performance.

Reliability from the Military Point of View.

It is true that with the war demand for performance there has been coupled a demand for reliability, but this has always been, within certain limits, a secondary matter.

A one in ten risk of engine failure, on a machine which can outdistance and outclimb any enemy machine one is likely to meet, is better worth taking than a one in three chance of being shot down by a superior adversary, even if the risk of engine failure be nil.

The Two Main Lines of Development.

Roughly speaking, the actual evolution of the aero-engine under the influence of this crying call for better performance, or in terms of the engine itself, for lower weight per h.p. has been confined to two main lines.

Probably most important has been a better use and distribution of the materials of which the engine is constructed, together with the development of materials possessing better physical qualities for their particular purpose.

This has led to a very considerable decrease in the weight of engines of given dimensions.

Almost equally important has been the increase in the mean effective pressure developed within the cylinders.

This second line of development has in many cases been disguised. There has been a noticeable increase in the actual developed pressure which has led directly to an increased h.p. from a given-sized cylinder at a given speed of rotation.

This increase, it must be noted, cannot be extended indefinitely, without increasing the structural weight, unless there is either a better use of materials or the use of better materials in the working parts. Thus this line of development is dependent upon the first to a certain extent.

The Real Problem of Increased Engine Speed.

Over and above the increase in the effective working pressure there has been an increase in the rotatory speed, or more accurately the piston speed, at which such pressures have been maintained.

This is really the same line of development in a less obvious form. The air and petrol mixture flowing through carburetter, induction pipes, and inlet valves encounters a certain resistance, which increases as the square of the speed at which the gas flows through any given part of the induction system.

This resistance is manifested by a reduction in the pressure, and therefore in the density, of the gas entering the cylinders, and the faster any given engine is made to run the lower the density of the incoming charge.

The lower the density of the charge the lower become both the compression and the mean explosion pressure.

Hence increasing the speed of rotation of any engine, other conditions remaining unchanged, must decrease the mean effective pressure developed.

For any given engine there will be a range of speed over which this effect is negligible, but it eventually shows itself by a marked falling off of the m.e.p. and the torque developed.

Therefore the problem of efficiently increasing the speed of rotation of any given engine beyond a certain limit becomes one of increasing the mean effective pressure at the higher speed.

Very largely this problem reduces to one of the design of inlet pipes, valves, and valve gearing which will offer the minimum of air resistance to the inflowing charge.

Both main lines of development and both the forms of the second line mentioned lead to higher intensity of stress in the working parts of the engine.

The use of material better adapted for its purpose leads to a reduction in size of a member carrying a given load.

Increase in the developed mean effective pressure obviously leads to increased stress intensity ultimately, since such items as bearing surfaces and so forth cannot be enlarged beyond definite limits imposed by the general layout and leading dimensions of the engine, except at the cost of excessive weight in other parts.

Increase in the speed of the engine increases all inertia loads throughout the engine.

A Matter of Overloading.

Thus the whole development of the aero-engine must be regarded as merely one huge conspiracy to load every working part to as near its ultimate strength as possible.

This process has been extended to all, or nearly all, the accessories of the engine proper.

Increased output from a cylinder of given size means that a greater amount of heat must be transferred through the cylinder walls.

In the water-cooled engine this calls for an increased speed of water circulation through the jackets. The process of loading up thus extends to the circulating pump.

Increased bearing pressures call for increased oil supply, therefore the oil pump shares the fate of the water pump.

Even the magneto, always a source of amaze and wonder, on account of the unexpected reliability of this piece of high-tension electrical apparatus most brutally ill-treated, is forced to do its share of the extra work.

A Rough Classification.

And in consequence it is possible to divide the modern aero-engine roughly into two classes.

One, and it is by no means the least effective class at the moment, is in the main just a decently designed engine based in all its main features upon its motor-car ancestor, run up to what is, for the original design, a violent overload, and covered with what can only be described as "gadgets" applied to fortify those parts which practice has shown most to need it.

The second class, which will almost certainly outlive the first, consists of those types of engine which have actually been designed without reference to the conventions of the ancestral car engine, but with an eye to so disposing their parts that they shall best withstand the heavy stress intensities under which they will have to work.

(To be continued.)

BY ERROR.

Sir,—With reference to your account of the lecture on "All Metal Aircraft" in a recent issue of The Aeroplane will you please correct the errors in my name and Service. I was never in the R.N.V.R., and my name is not Thurstan.

The Thurstons of East Anglia are not related to the Thurstans of Mercia, at least from very early times.

(Signed) A. P. Thurston (Capt. R.A.F.).

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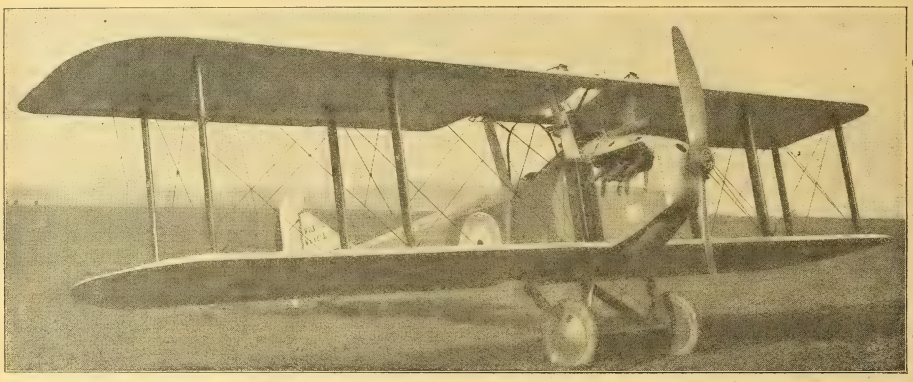
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V.—Sir Wm. Beardmore & Co., Ltd.—(*Continued.*)



The Beardmore Type "W.B.V" Ship Plane (200 h.p. Hispano-Suiza Engine).

THE BEARDMORE BIPLANE W.B. V.

This machine was also designed as a ship single-seater fighter, and was of very much the same overall dimensions as the W.B. IV.

Instead of placinf the engine over the C.G., driving the propeller by a shaft passing between the pilot's legs and designing the fuselage to provide the necessary buoyancy for flotation after alighting on the sea, the conventional engine in front arrangement was adopted, and the necessary buoyancy had to be provided by external air bags.

SPECIFICATION.

Type of machine	Biplane.
Name or type No. of machine	W.B. V.
Purpose for which intended	Ship's Scout.
Span	35 ft. 10 ins.
Gap	4 ft. 9 ins.
Overall length	26 ft. 7 ins.
Maximum height	11 ft. 10 ins.
Chord	6 ft. 3 ins
Total surface of wings, including ailerons	394 sq. ft.
Span of tail	11 ft. 9 ins.
Total area of tail	50.5 sq. ft.
Area of elevators	24 sq. ft.
Area of rudder	12 sq. ft.
Area of fin	8 sq. ft.
Area of ailerons	18.8 sq. ft. each, 37.6 sq. ft. total.
Maximum cross section of body	11.5 sq. ft.
Horizontal area of body	46.5 sq. ft.
Vertical area of body	58 sq. ft.
Engine type and h.p.	Hispano-Suiza 200 h.p.
Airscrew, diam. and revs.	9 ft., 1,500 r.p.m.
Weight of machine empty	1,860 lbs.
Load per sq. ft.	6.33 lbs.
Weight per h.p.	12.5 lbs.
Tank capacity in hours	2.55 hours.
Tank capacity in gallons	37 gallons.
Performance—	
Speed low down	112 m.p.h.
Speed at 10,000 feet	103 m.p.h.
Landing speed	45 m.p.h.
Climb—	
To 5,000 feet	6 mins.
To 10,000 feet	17 mins.
Disposable load apart from fuel	340 lbs.
Total weight of machine loaded	2,500 lbs.

THE BEARDMORE TORPEDO CARRIER W.B. VI.

The Beardmore single-seater, torpedo-carrying, folding ship-aeroplane, type W.B. VI, was the result of many efforts to produce a satisfactory, fast torpedo-carrier. The general arrangement is on conventional lines, with the pilot well back in the fuselage.

The under-carriage is arranged to permit the stowage and dropping of a torpedo under the centre of gravity.

SPECIFICATION.

Type of machine	Biplane.
Name or type No. of machine	W.B. VI.
Purpose for which intended	Torpedo Carrier.
Span	Top 53 ft. 6.5 in., bottom 47 ft. 10.5 in.
Gap	7 ft. 6 in.
Overall length	34 ft.
Maximum height	12 ft. 6 in.
Chord	Top 8 ft. 10 in., bottom 7 ft. 9 in.
Total surface of wings, including ailerons	796 sq. ft.
Span of Tail	15 ft. 9 in.
Total Area of Tail	80 sq. ft.
Area of Elevators	32.4 sq. ft.
Area of rudder	12 sq. ft.
Area of fin	10 sq. ft.
Area of ailerons	47.75 sq. ft. each. total 95.5 sq. ft.
Maximum cross section of body	10 sq. ft.
Horizontal area of body	62 sq. ft.
Vertical area of body	100 sq. ft
Engine type and h.p.	Rolls-Royce Eagle 350 h.p.
Airscrew, diam. and revs.	12 ft., 1,080 r.p.m.
Weight of machine empty	3,027 lbs.
Load per sq. ft.	7 lbs. fl
Weight per h.p.	15.6 lbs.
Tank capacity in hours	3 hours.
Tank capacity in gallons	70 gallons.
Performance—	
Speed low down	102 m.p.h.
Speed at 10,000 feet	91 m.p.h.
Landing speed	47 m.p.h.
Climb—	
To 5,000 feet	15 minutes.
To 10,000 feet	41 minutes.
Disposable load apart from fuel	2,060 lbs.
Total weight of machine loaded	5,637 lbs.

THE BEARDMORE TRIPLANE W.B. VIII.

The Beardmore three-engine passenger and cargo triplane is designed on similar lines to the Caproni triplane long-distance bomber. There are two fuselages, with passenger compartments in the nose of each, and a central nacelle carrying the crew and one power unit.

Three power units, each a 500 h.p. Beardmore "Atlantic" engine, are carried, the two outer ones driving geared airscrews through shafts running along the top inside longeron of each fuselage, and the central engine driving a single pusher in the rear of the nacelle.

The tail is a biplane, with three comma-edged balanced rudders.

SPECIFICATION.

Type of machine	Triplane.
Name or type No. of machine	W.B. VIII.
Purpose for which intended	Passenger and Cargo Carrier
Span	Top 120 ft., bottom 118 ft.

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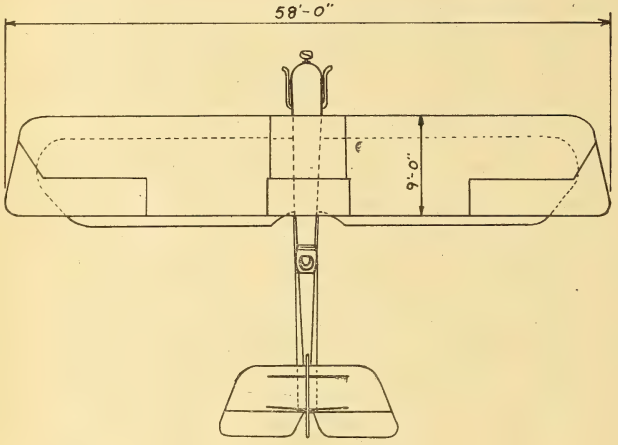


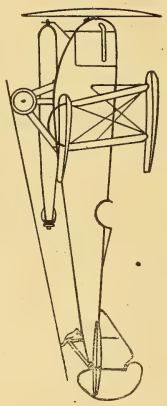
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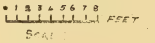


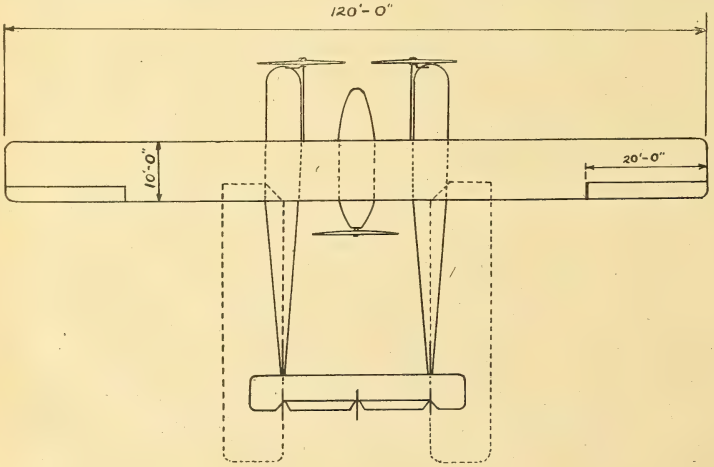


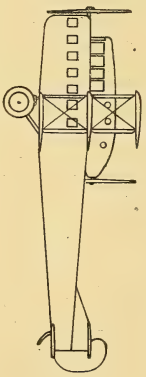
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TYPE W.B. VI.

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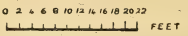




BEARDMORE PASSENGER CARRYING AEROPLANE.

TYPE W.B.8.

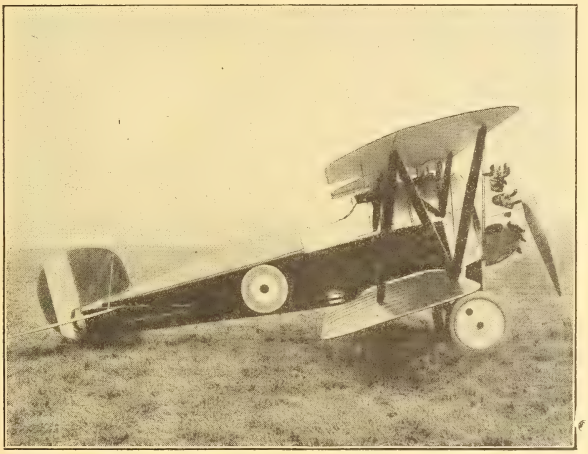
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AT FARNBOROUGH IN APRIL, 1919, A BRISTOL SCOUT FITTED WITH A "**MERCURY**" ENGINE CLIMBED 10,000 FEET IN 5 MINS. 25 SECS., & 20,000 FEET IN 16 MINS. 15 SECS., SPEED AT 10,000 FEET 143 M.P.H. OFFICIAL CORRECTED BAROGRAPH FIGURES.

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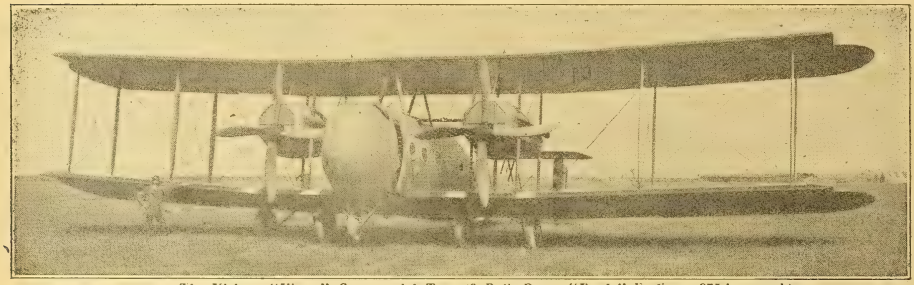
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20,000 FEET IN 16 MINUTES 15 SECONDS

Gap	8 ft.
Overall length	62 ft.
Maximum height	23 ft.
Chord	10 ft.
Total surface of wings, including ailerons	3,260 sq. ft.
Span of tail	37 ft.
Total area of tail	430 sq. ft.
Area of elevators	72 sq. ft.
Area of rudder	105 sq. ft.
Area of fin	77 sq. ft.
Area of ailerons	55 sq.ft. each; total 220 sq.ft.
Maximum cross section of body	132 sq. ft.
Horizontal area of body	645 sq. ft.
Vertical area of body	490 sq. ft.
Engine type and h.p.	Three Beardmore Atlantic, 500 h.p. each.
Airscrew, diam. and revs.	15 ft., 900 r.p.m.
Weight of machine empty	14,262 lbs.
Load per sq. ft.	8.37 lbs.
Weight per h.p.	18.2 lbs.
Tank capacity in hours	6 hours.
Tank capacity in gallons	660 gallons.
Performance (estimated)—	
Speed low down	92 m.p.h.
Speed at 10,000 feet	81 m.p.h.
Landing speed	53 m.p.h.
Climb—	
To 5,000 feet	15 minutes.
To 10,000 feet	41 minutes.
Disposable load apart from fuel	7,450 lbs.
Total weight of machine loaded	27,320 lbs.

THE VICKERS COMMERCIAL TYPE "VIMY" MACHINE.



The Vickers "Vimy" Commercial Type (2 Rolls-Royce "Eagle" Engines, 375-h.p. each).

This aeroplane is a modification of the Vickers "Vimy" bomber, which is being supplied in great numbers. It is necessary to mention this in order to emphasise:—

(1) That this aeroplane has been flown under stringent war conditions.

(2) The obvious advantage of an aeroplane that can be used either for war or commercial purposes by the rapid interchangeability of the respective fuselages.

It is of interest to note that the fuselages constitute the sole difference between the "Vimy" bomber, the "Vimy" commercial, and the "Vimy-Rolls" trans-Atlantic aeroplane.

In dealing, then, with the 'Vimy" commercial, those who already know the bomber will have a fair idea of its general appearance.

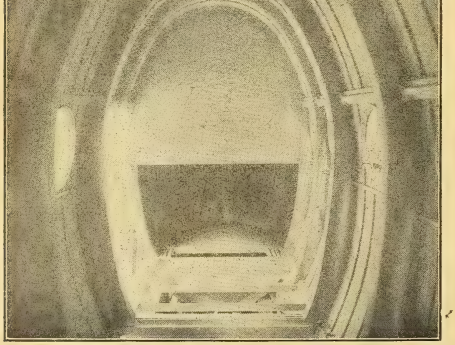
The fuselage is constructed on the "Monocoque" principle, the "shell" of the cabin being attached to oval wooden rings of box section.

These rings are built up of three-ply, are light, and have immense strength. The cover of the cabin is made under the "Consuta" patent, manufactured by S. E. Saunders, Ltd., of Cowes, who are allied with the Vickers Company.

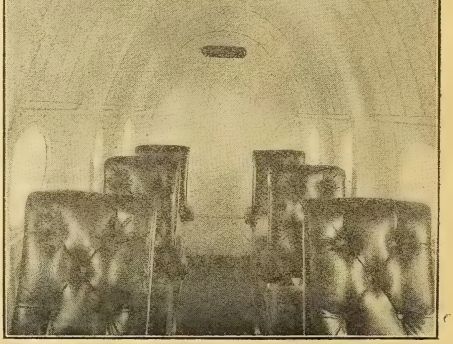
Consuta is constructed of thin layers of selected wood, with the grain placed diagonally, glued and sewn together with rows of stitching running in parallel lines about 1½ inches apart. The strength of this material is very great, it gives a high factor of safety to the whole construction of the cabin, and entirely dispenses with any cross-bracing wires in any direction. The doors in the fuselage are watertight, and the machine will float in a normal position on water.

Two pilots are carried side by side in a cockpit placed high up in the "nose," giving a wide range of vision, and dual controls are provided throughout.

All the spars are of box section of spruce and three-ply wood bound with fabric; the interplane struts are of hollow spruce, except in the engine bay, where the struts are of round steel tube, reinforced where necessary and fitted with wooden fairings; the ribs are of spruce. The engine mounts are carried



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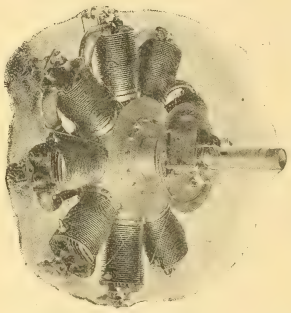
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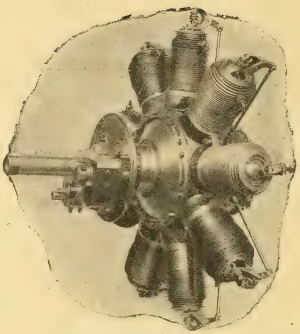
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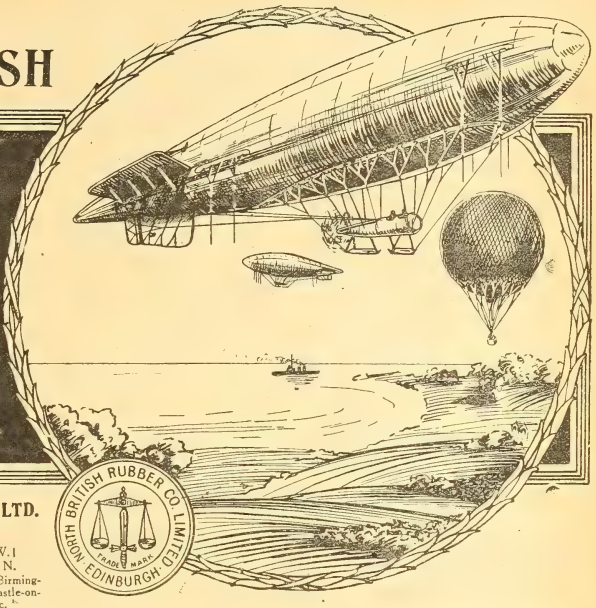
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Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

Glue—
Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Beccecolin, Cannon, London." City 1206.
Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid.) "Excroiden, 'Phone, London." Avenue 4611-2.
Meudine Co., 8, Arthur Street, E.C. Bank 5873.

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340

Heating and Ventilating—
Chas. P. Kinnell and Co., Ltd., 65 & 65A, Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 703.

Instruments—
British Wright Co., Ltd., 23, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

Insurance—
Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 6944.
Bray, Gibb & Co., Ltd., 166, Piccadilly, W.1.
S. Sackville & Sons, Duchy Chambers, 4, Clarence Street, Manchester.
Harold Townend, Ltd., 13-14, Abchurch Lane, King William Street, E.C.4. "Carinsur, London." Central 156 (2 lines).
Percy Wingfield, 22, Newgate Street, E.C.1. City 4672.

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London. "Pegamoid, Cent., London." City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—
W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines.)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 430.
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asteroidal, Coventry." Coventry 278.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 999 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—
Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros, Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham." Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115.

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Mann, Egerton & Co., Ltd., 379/383, Euston Road, London, N.W.1. "Manegeon, Eusroad, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—
C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London" Central 11305 & 13466.

Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central (5 lines.)
C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Occasi, Sheffield." Sheffield 2149

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.
Integral Propeller Co., Ltd., "Ayiprop, Hyde, London." Hendon 9. Kingsbury 104.
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 26547-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 26.

Rawhide Hammers—
Ira Stephens, Whitelands Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 & 3812.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830
British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).



The · Aeroplane ·

Accumulators—
The Chloride Electrical Storage Co., Ltd., Clifton Junction, near Manchester. "Chloride, Pendlebury" Central Manchester, 1058. Pendleton, 11.

Acetylene Welding Plant—
Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London" Vic 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London" 3540 Victoria (3 lines).

Aeroplane Manufacturers—
Aircraft Manufacturing Co., Ltd., Hendon. "Armanship, Hyde, London" Kingsbury 220.
Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne" Gosforth 500.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich" Norwich 851.
British Aerial Transport Co., Ltd. Head Office: 78, Conduit Street, London, W.1. "Batigram Reg, London" Mayfair 637, 638.
Works: Hythe Road, Willesden, London, N.W.10. "Airbrians, Phone, London" Willesden 2272, 2273.
Bristol & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol" Bristol 3000.
British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London" Hampstead 5551.
Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London" Hampstead 3303 and 4424.
Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne" Central 2604 (2 lines).
Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne" Eastbourne 1176.
Gosport Aircraft Co., Gosport. "Flight Gosport" Gosport 217.
Graham-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London" Kingsbury 120.
London Office, 12, Regent Street, S.W.1. Regent 2064.
Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydroplid, Crickle, London" Hampstead 7400.
Hooper & Co., Ltd., 54, St James St., Piccadilly, London, S.W. "Sociable, St James, London" Regent 912.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 482 (4 lines).
Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge" Woking 331, Byfleet 171.
"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London" Willesden 2455.
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford" Bradford 3709 (4 lines).
The Regent Carriage Co., Ltd., 128/132, New King's Road, Fulham, S.W.6. "Carbodis, London" Putney 2240-2241.
Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester" City 8516-8531, Manchester.
Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes" Cowes 193.
Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London" Regent 378.
The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."
Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston" Kingston 1968 (8 lines).
The Supermarine Aviation Works, Ltd., Southampton. "Supermarin" Woolston 37 (2 lines).
Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet" Byfleet 1, 2 & 3.
Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyta, Knights, London." Kensington 6810.
Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.
Westland Aircraft, Yeovil. "Aircraft, Yeovil" Yeovil 129.
White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Airships—
Airships, Ltd., High Street, Merton. Wimbledon 1314.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)
Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London" Regent 378.
C. G. Spencer and Sons, Ltd. (See under "Balloons").

Aluminium Castings (Sand and Die)
Coan, R. W., 210, Goswell Road, London, E.C.1. "Krankenses, Isling, London." City 3846.

Balloons—
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)
C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronaut, London." Dalston 1203.

Bent Timber Parts—
Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Euspare, London" Museum 460. Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough" Market Harborough 15.

Bearings (Etonia Cast Phosphor Bronze)
Brown Bros., Ltd., 61, Eastern St., E.C.1. Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds" Central 3027.

Blowpipes (Oxy-Acetylene)—
Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London" Vic 3540 (3 lines).

Bolts—
Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16. Dalston 2500 (2 lines).

Books (Aero Engines)—
Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2.

Buildings—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.
Rubery Owen & Co., Darlaston, South Staffs.

Cable Coverings and Cable Controls—
The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green" Acock's Green 103 & 104.
Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2300 (3 lines).
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—
Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4070.

Casein—
Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricodon, Fen, London" Avenue 34 and 35.

Clothing—
Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.
Dunhill's Ltd., Euston Road, N.W.1. "Dunsecal, London" North 3400-6.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh" Edinburgh 3880 Central. (5 lines.)

Component Parts—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).
Brown Bros., Ltd., 61, Eastern St., E.C.1.
Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, 'Phone, London." Hampstead 4403 & 4404.
P.D.V. Aircraft Co., Ltd., Princes Street, Richmond. "Acros, Richmond" Richmond 1681.
Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—
MacLennan, J., & Co., 30, Newgate Street, E.C.1. "And at Glasgow. City 3115.

Dopes—
Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafrec, Picey, London" Gerrard 2312.
British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London" Regent 4040.
The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Picey, London" Gerrard 280.
Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Rec, London" Gerrard 440.
Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London" East 955.

Engines and Parts—
Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford" Bedford No. 1.
Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries" Dumfries 281-282.
Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London" Gerrard 238.
The Cosmos Engineering Co., Ltd., Fishponds, Bristol. City 1206.
Dudbridge Iron Works, Ltd. (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London." Vic 7026.
Gordon Watney & Co., Ltd., Weybridge. "Mercedès, Weybridge" Weybridge 550 (7 lines).
Green Engine Co., Ltd., Twickenham. Richmond 1203.
Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1910.
Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London" Gerrard 8926.
Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1. "Rollecad, London" Gerrard 1654-5-6.
The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."
Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton" Wolverhampton 685.
The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Eleven-fold, London." Walthamstow 811 (2 lines).
Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames" Walton-on-Thames 220.

Electrical Accessories—
Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1684.
Brown Bros., Ltd., 61, Eastern St., E.C.1.
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London." Willesden 2480.

Electric Cables—
E. Kalker and Co., Coventry. "Kalker, Coventry" Coventry 243.
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London" Central 2207; London Wall 1564.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W. "Installing, Eusroad" Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—
W. Canning & Co., 131-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 5622 Central (3 lines).

Flare Lights—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London" Victoria 3540 (3 lines).

Flexible Shafts—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.



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Fluxes—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).
The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich" Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham" East 407.

Glue—
Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Beececoin, Cannon, London." City 1206.
Improved Liquid Glues Co., Ltd., 61, Hermitage Street, E. (Croid.) "Excroiden, 'Phone, London" Avenue 4041-2.
Mendine Co., 8, Arthur Street, E.C. Bank 5573.

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Picey, London" Regent 1340.

Heating and Ventilating—
Chas. P. Kinnell and Co., Ltd., 65 & 65A, Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 705.

Instruments—
British Wright Co., Ltd., 23, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

Insurance—
Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 6944.
Bray, Gibb & Co., Ltd., 166, Piccadilly, W.1.
S. Sackville & Sons, Duchy Chambers, 4, Clarence Street, Manchester.
Harold Townend, Ltd., 13-14, Aberchurch Lane, King William Street, E.C.4. "Carinsur, London." Central 156 (2 lines).
Percy Wingfield, 22, Newgate Street, E.C.1. City 4072.

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London. "Pegamoid, Cent., London." City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—
W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C., Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines).

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 430.
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asterdial, Coventry." Coventry 278.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 599 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—
Samuel Mercer & Co., 168, Upper Thames Street, E.C.4. "Reconciled, Cannon, London" City 6342.

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton" Wolverhampton 1041.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., 61, Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop" Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvopult, Phone, London" Holborn 410.
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsaero, Phone, London." Regent 1181.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London" Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast" Belfast 4035-4034-4035.
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethrod, London" London Wall 6300.
Herbert Frood Co., Ltd., Chapel-le-Frith. "Frodobrake, Birmingham." Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115.

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Mann, Egerton & Co., Ltd., 179/381, Euston Road, London, N.W.1. "Manegwear, Eusroad, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Picey, London." Regent 1340.

Oils—
C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London" Central 11305 & 13466.

Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London" London Wall 3200-3207.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)
C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149.

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch" Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich" Norwich 851.
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston" Kingston 672.
Integral Propeller Co., Ltd., "Aviprop, Hyde, London" Hendon 9, Kingsbury 104.
Lang Propeller, Ltd., Weybridge. "Acrosticks, Weybridge" Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds" Leeds 20847-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil" Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 20.

Rawhide Hammers—
Ira Stephens, Whitelands Leather Works, Ashton-under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 5811 & 5812.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester" City 4432.

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3709 (4 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London" 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London" Willesden 2480.

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London" Vic 4830.
British Metal (Kingston), Ltd., Kingston-on-Thames. (Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsaero, Phone, London." Regent 1181.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

"The Aeroplane" Buyers' Guide.—*continued.*

Solder Manufacturers—

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Sparking Plugs—

Brown Bros., Ltd., Great Eastern St., E.C.1
Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Robinhood Engineering Works, Ltd., 4 Newlands, Putney Vale, S.W.15. Makers of K.L.G Plugs. "Kaelgee, Phone, London." Putney 2132-3.

Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

Steel—

Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield." Central 4522-3-4.

Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Tapes and Smallwares—

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 1115.
C. E. Matthews & Co., Ltd., Castle Works, Bermondsey Square, S.E.1. "Webbance, Berm, London." Hop 4058.

Timber—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Eusquare, London." Museum 496.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Time Recorders—

Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—

Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349.

Turnbuckles—

Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery Owen & Co., Darlaston, South Staffs.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston road." Museum 70 (4 lines).

Tyres and Wheels—

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Central 3880 (5 lines).
The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Varnishes—

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjap, Phone, London." Mayfair 6347 (3 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 2395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—

Terry, Herbert, & Sons, Ltd, Redditch. "Springs, Redditch." Redditch 61

Welding and Cutting Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Welding Repairs—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac," Phone, London." Victoria 3540 (3 lines).

Wind Shields—

Auster, Ltd., 133, Long Acre, W.C. "Windflector, London." Regent 5070.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Wire Gauze—

Greening, N., & Sons, Ltd, 16, Finsbury Street, London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.

Wire and Cables—

Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

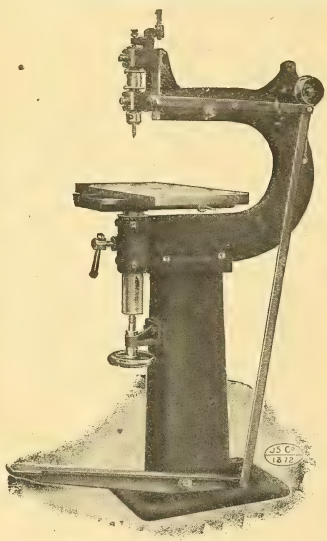
Wirework—

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Woodworking Machinery—

Robinson, Thomas, & Son, Ltd., Rochdale, "Robinson, Rochdale" Rochdale 467.
Sagar, J., & Co., Ltd., Halifax. "Sawtooth," Halifax." Halifax 136.
Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.

SAGAR



High Speed Routing, Carving and Recessing Machine.

This Machine is used for grounding or routing out the surplus material in sunken moulded panels and carvings all kinds of light trenching, recessing, boring, etc., and is particularly useful for Aircraft Factories. It is made in different sizes fitted with different kinds of sliding tables, and we shall be pleased to send full particulars of the various Machines on request.

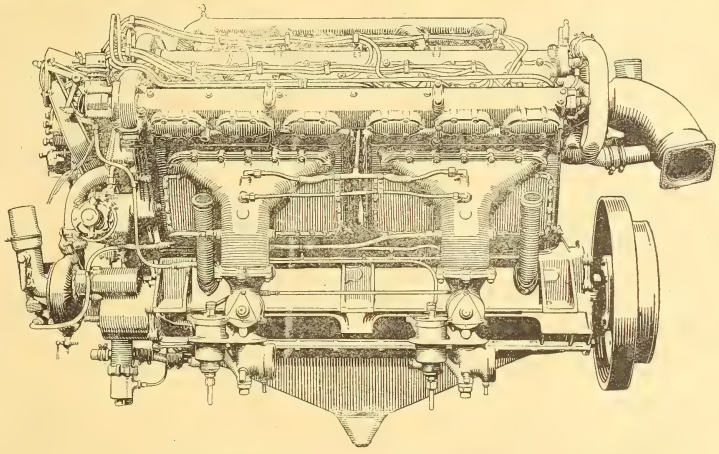
Full particulars of other Wood-working Machines specially suitable for Aircraft Factories will be gladly sent on request.

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The 12cyl. 275 H.P. Sunbeam-Coatalen Maori Engine, with direct drive.
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THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS

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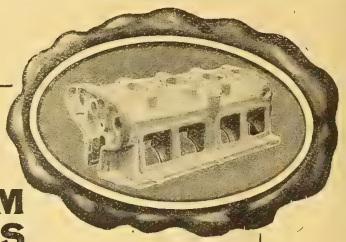
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ALUMINIUM CASTINGS

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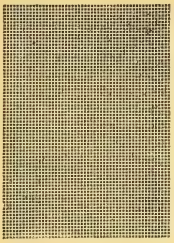
We also make Cylinders and Pistons in STERLING IRON; Castings in High Tension Bronzes; Phosphor Bronze (various alloys for different purposes); Brass, Aluminium.

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FOUNDERS IN ALUMINIUM GUNMETAL & IRON

Coventry

TELEGRAMS: STERMET, COVENTRY. TELEPHONE: COVENTRY 881



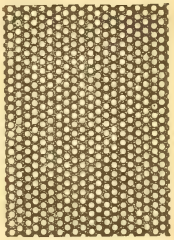
ESTABLISHED 1799.

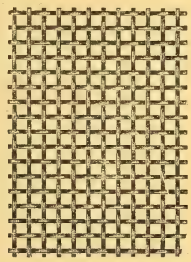
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WIRE GUARDS AND
WIRE WORK OF
EVERY DESCRIPTION.





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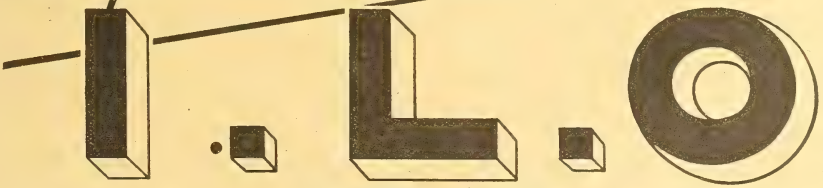
OIL AND PETROL STRAINING.

LONDON WAREHOUSE:—

16, FINSBURY STREET, E.C.2.



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MEANS



W.B.DICK & CO. LTD. 90, FENCHURCH STREET, E.C.3.

Telephone: Avenue 7854. Telegrams: Dicotto, Fen, London.



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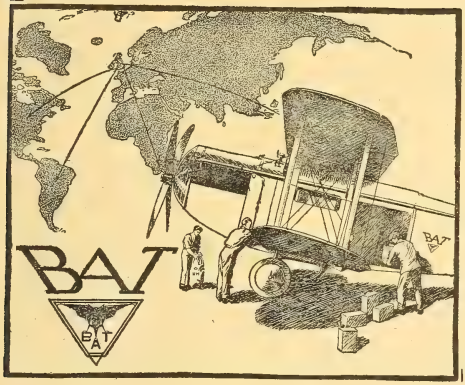
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Round the world by Air

is mainly a question of organisation and *choice of flying stock.* As to the second factor, the B.A.T. Company can be of unusual assistance.

For instance, we are the first people out with a purely commercial model (not a modified war type)—the B.A.T., F.K.26—the machine with the largest cargo space and load capacity for its overall size and power yet produced.

Here are some interesting points concerning F.K.26 :—



ENGINE :—Rolls-Royce Eagle VIII.

SPEED :—45-120 m.p.h.

CABIN :—Is clear of any transverse cross bracings or other obstruction, and measures 8 ft. by 3 ft. 3 in. by 6 ft.—this in a machine of only 33 ft. overall length. Direct entry off ground through ordinary door.

LOAD :—With 600 mile range of fuel—2,000 lbs.

FUEL COST AT FULL LOAD :—7½ pence per mile.

CHASSIS :—A sturdy jib, sprung by an unique combination of oleo and rubber shock absorbers.

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GENERAL CONSTRUCTION :—Straightforward—simple to repair and recondition.

A series of these machines is in production. Governments and prospective owners desiring a fleet of these machines—or a single one—are invited to forward their enquiries.

Complete particulars on application to :—

The BRITISH AERIAL TRANSPORT CO. LTD.
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Reducing Productive Cost

When cost of Labour rises, when materials generally have an upward tendency, when the hours of working fall, then plant and POWER must count.

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One of the Formers for the Cabin Structure.

on four struts each side, and the chassis is attached below the engine mountings, thus minimising the load in the anti-lift wires.

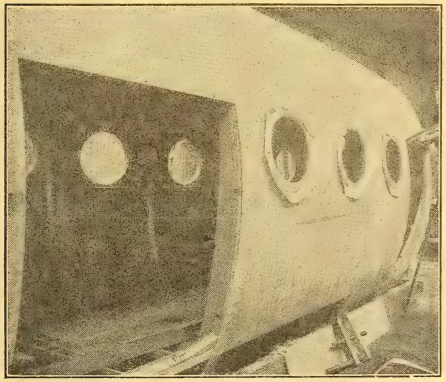
The after part of the fuselage is of wood and swaged tie rod construction, the longerons being made under Vickers-Ryan patents.

Throughout the machine, streamline steel tie rods are used in external bracing, and round steel rods in all internal bracing; looped wires and ferrules are not used in any important part.

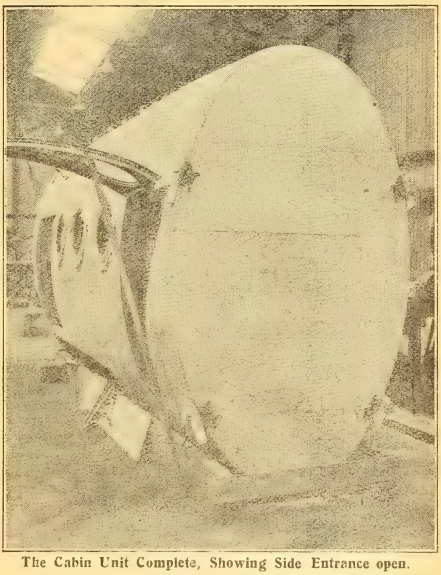
Two Rolls-Royce "Eagle" Mark VIII are installed, giving a total of 750 h.p. Should one engine fail completely, the machine can fly on the other engine alone at a speed of 70 miles per hour.

The petrol supply is maintained by fan-driven petrol pumps with regulating valves to maintain a constant flow to a service tank with overflow return to main tanks.

Sufficient petrol is carried for a continuous flight of 5 hours.



View of the Cabin Showing Luggage Door.



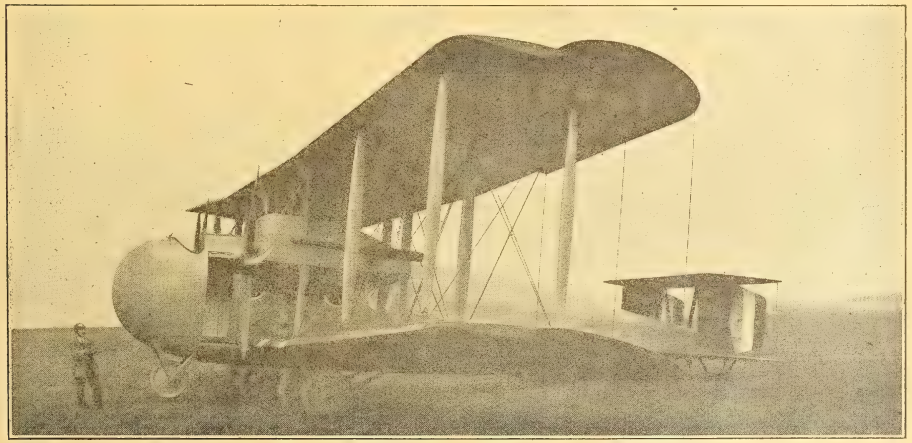
The Cabin Unit Complete, Showing Side Entrance open.

Should a greater endurance be required, extra tanks can be fitted.

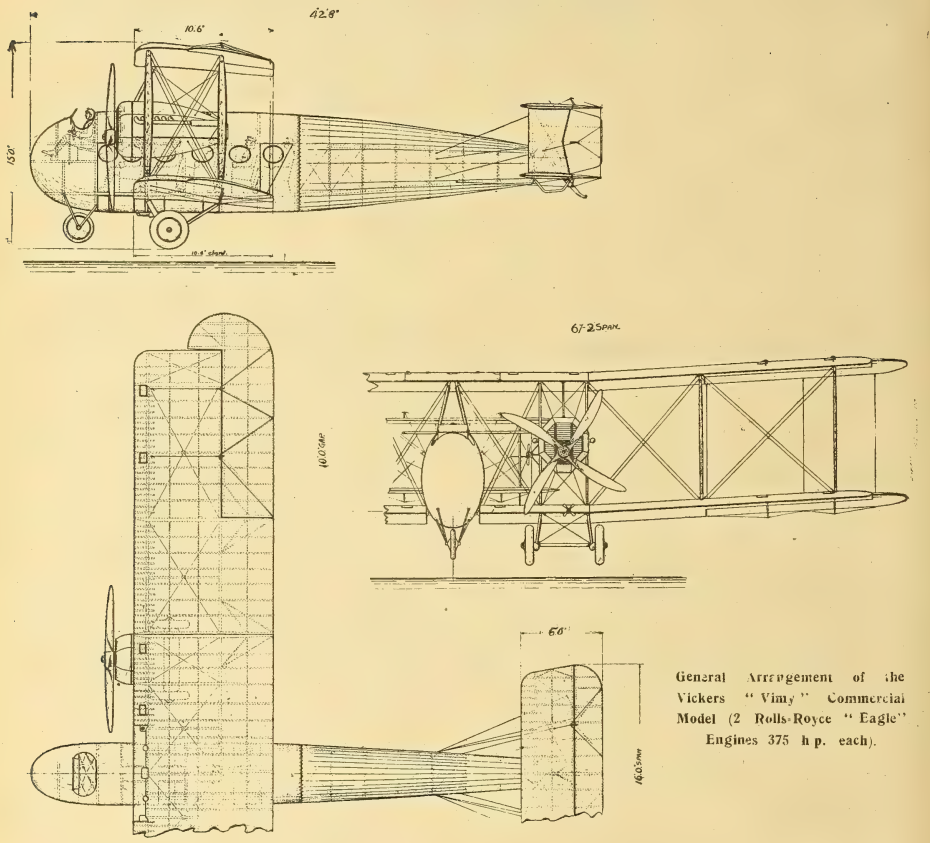
All flying controls are remarkably light in operation, as balanced control surfaces are used where necessary.

In no part has strength and solidity of construction been sacrificed to lightness, a factor of safety of $4\frac{1}{2}$ being provided throughout the machine.

The cabin is totally enclosed, and has a seating capacity for 10 passengers in separate armchairs. A gangway runs down the centre of the car, and there is ample space between the chairs. Cupboards are provided at the end of the cabin for the storage of light hand luggage. A separate window is placed at the side of each person, and both height and speed indicators are fitted for those who are interested in the new conditions of travelling. Telephonic conversation can be carried on between the pilot and the passengers, and the ventilation and heating can be adjusted as desired to suit any temperature conditions.



Side View of the Vickers "Vimy" Commercial Machine.



General Arrangement of the Vickers "Vimy" Commercial Model (2 Rolls-Royce "Eagle" Engines 375 h.p. each).

Noise has been reduced to a minimum, and vibration entirely abolished.

The seats in the cabin can be detached in a few minutes, giving a floor area of 53 square feet, and a volumetric capacity of 300 cubic feet for freight, which can be kept at an even temperature and dry. The maximum weight which can be carried is 2,500 lbs.

When mail-carrying, sorting-boxes are fitted, and the process of sorting can be carried out on similar lines to the arrangements now in operation on the mail trains.

The following table gives the plain particulars of the machine :—

SPECIFICATION.

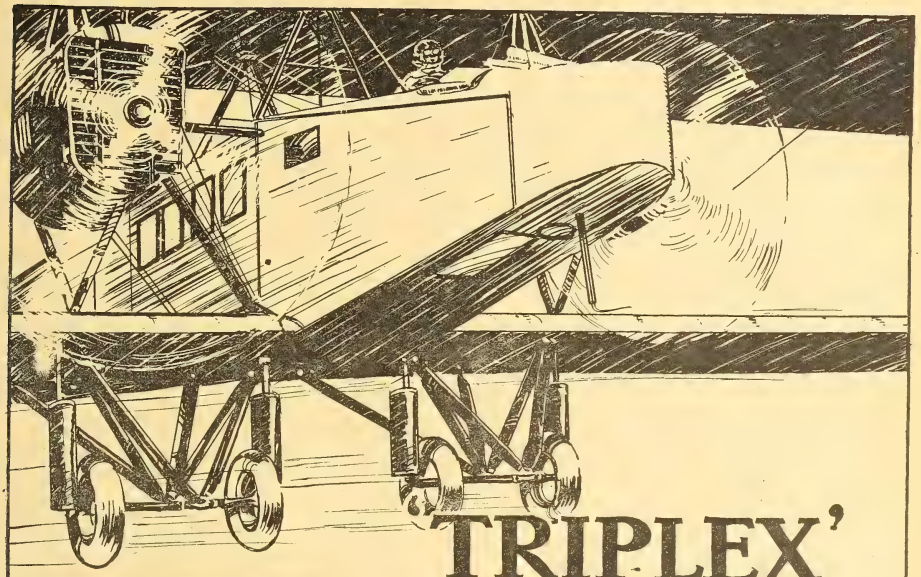
Type of machine	Twin-engined tractor biplane.
Name or type No. of machine	Vickers "Vimy."
Purpose for which intended	Commercial.
Span	67 ft.
Gap, maximum and minimum	10 ft.
Overall length	42 ft. 8 ins.
Maximum height	15 ft. 3 ins.
Chord	10 ft. 6 ins.
Total surface of wings	1,330 sq. ft.
Span of tail	16 ft.
Engine type and h.p.	2 375 h.p. "Eagle" Rolls-Royce.
Weight of machine empty	7,292 lbs.
Load per sq. ft.	8.4 lbs.
Weight per h.p.	16.4 lbs.
Tank capacity in hours	5 hours.

PERFORMANCE—

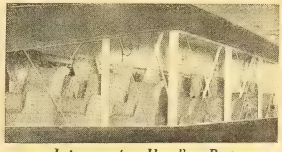
Speed low down	110 m.p.h.
Speed at 6,000 ft.	103 m.p.h.
Speed at 10,000 ft.	99 m.p.h.
Landing speed	45 m.p.h.
Climb—	
To 6,000 ft. in minutes	17 mins.
To 10,000 ft. in minutes	48 mins.
Disposable load	2,308 lbs.
Total weight of machine loaded	11,120 lbs.



The "Vimy" Commercial Biplane in Flight.



TRIPLEX' Safety GLASS IN CIVILIAN FLYING



Interior of a Handley Page Passenger Aeroplane.



Inside of H.M. Air Liner "Silver Star."

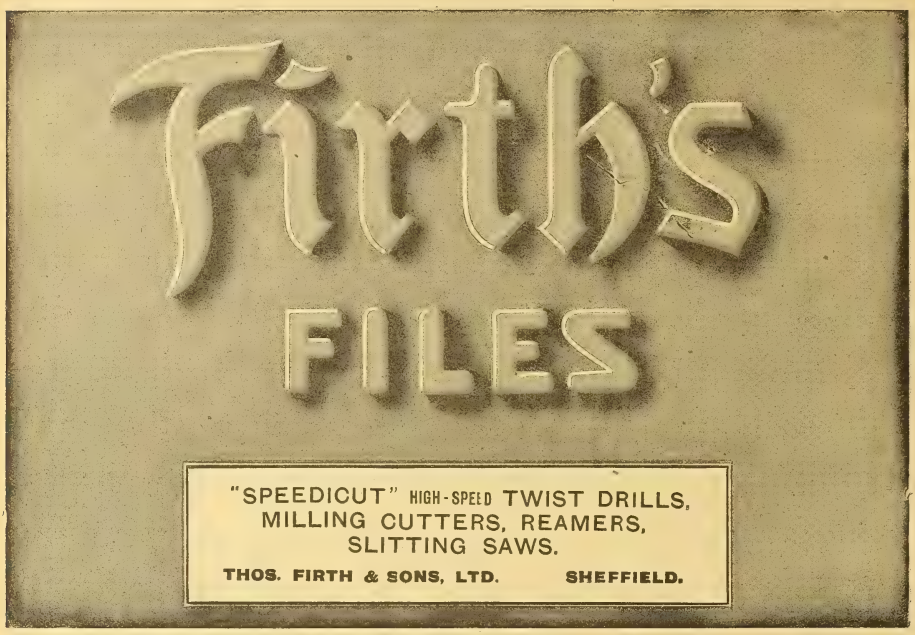


Showing windows in H.M. Air Liner "Great Britain."

The whole question of the public support of flying, and of the establishment of public confidence in travelling by air, depends much upon the provision of every possible safety precaution in machines employed for civilian service. Amongst the most important of these essentials is the stipulating of "Triplex" Safety Glass for all panels, windows and windshields, and for the eyepieces of goggles, for without this precaution many serious and perhaps fatal accidents must occur from flying splinters of glass on the least concussion or shock of landing. "Triplex" Safety Glass is absolutely and definitely unsplinterable under any impact or communicated shock. Catalogue No. 3 explains exactly what "Triplex" can withstand and how it is made.

THE TRIPLEX SAFETY GLASS CO., LTD.,
Reginald Delpech (Managing Director),
1, ALBEMARLE STREET, W.1.
Tel.—Regent 1321 (3 lines). 'Grams—Shatterlys, Piccy, London.





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ENGINEERS, LONDON.

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NOTES ON PARACHUTES AND PARACHUTE FLARES.—II.

BY LIEUT.-COL. H. S. HOLT.

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These papers were originally designed for technical readers, but at the Editor's suggestion I have put this and succeeding ones in more popular form. This entails the addition of a certain amount of explanatory matter that would be superfluous for parachute specialists.

GERMAN PARACHUTES.

With the exception of the Robert, all the single parachute systems mentioned in the first paper function on the same principle: The parachute case or receptacle is fixed to the aircraft, the parachute and the parachute lines being packed inside. The main cable of the parachute is made fast to the passenger's harness, so that when he jumps overboard his weight withdraws the parachute, the crown or apex being the last portion to leave the case.

In the German parachutes, which are scientifically designed although rather roughly made, the case is usually carried on the passenger's back and attached to the harness, though in one type it is hinged in such a way that the passenger can sit on it when not in use. The principle on which the parachute is withdrawn is the inverse of that already described.

A cord is attached to the crown or centre of the parachute, and made fast to the aircraft. When the passenger goes overboard the parachute is withdrawn from its case by this cord, which is made sufficiently light to break or become detached when the man's weight comes on it.

This is a better principle in so much as the parachute is pulled from the crown or centre instead of from the circumference, so that the lines are not taut when the circumference of the parachute leaves its receptacle. There is thus much less chance of the mouth being kept closed and suction taking place from the centre hole to the folds so that the parachute either does not open at all or not till after it has fallen a considerable distance. On the other hand, as the parachute lines are slack when they leave the case there is more risk of their getting entangled. In his own parachutes the writer has got over this in a special way which he will describe later on.

But although somewhat different in principle, the German parachutes have the same defect as those already described, viz., that they offer little or no chance of escape from a falling machine.

The writer made very careful inquiries in France last autumn, and though he found records of a certain number of Germans escaping from their aeroplanes in parachutes, there was not a particle of evidence to prove that they had ever escaped from a machine that was actually falling. The presumption is therefore very much to the contrary.

THE HOLT COMPOUND PARACHUTE SYSTEM.

It was, the writer thinks, in the spring of 1912 that he happened to be present at an aerodrome in England in connection with some experiments with his parachute flares, when a set of the Cody-kites were being sent up, and it was the grouping of these kites that first suggested to him the employment of parachutes in tandem. But in those days the scheme did not seem to have any practical use. The life or man-dropping parachute was little more than the stock-in-trade of professional parachutists, and large parachute bombs had not been dreamt of. Colonel Maitland was undoubtedly the pioneer of Military parachuting in England; and the kite balloon crews of to-day owe much to his adventurous enterprise in the past.

The compound or tandem parachute system consists of a large or "main" parachute, to the crown or centre of which a smaller parachute, which the writer calls a "pilot" parachute, is attached.

It was not till the writer returned from France in the middle of 1915 that he saw his way to making practical use of this system, and he believes in the near future all large parachutes of 20 feet diameter or over will be fitted with this device. If the difficult problem of salving an aeroplane itself out of control is ever solved, the solution will be some form of triple or quadruple parachute.

The difficulty of designing a large parachute especially for life-saving purposes is that such an enormous factor of safety has to be allowed for, over and above that which would be required for the mere support of the load carried. The strain put on a parachute at the moment of opening is infinitely greater than any other; and unfortunately it is a very variable quantity depending, in the case of a parachute launched from a captive balloon, on the distance it falls before opening.

If a parachute is launched from a rapidly moving aeroplane additional and severe strains may be thrown on the parachute fabric and the difficulty of design increased. In the compound or tandem parachute system the strain on the main parachute is always the same within small limits, and can be accurately estimated. A small strongly built pilot parachute is released and opens first. Its "pull" then withdraws the main parachute from its case.

By simple timing devices the release of the main parachute can be delayed as long as desired; but the strain on it when opening will always be the same, because a well-designed pilot parachute attains its equilibrium or terminal velocity in a few feet.

In certain cases the writer employs a secondary pilot parachute of very small diameter and made of as light and thin a material as possible, whose function is to draw out the first pilot parachute. This is only necessary where the first pilot has to be made of considerable diameter and very strong and heavy.

Theoretically the strain on the main parachute can be reduced to any extent by varying the relative areas of the main and pilot parachutes. But practically there are limits beyond which one cannot go; as, for instance, if one made the pilot larger than the main, which would be an absurdity.

The essentials for a good pilot parachute are smallness of area relative to the main parachute, great strength of material and design and rapid inflation. Roughly speaking, the proportion of load on the main parachute varies in the ratio of the effective areas of the two; but other factors affect the figure, such as the distance of the main from the pilot and the area of the hole in the former.

The writer in practice attaches the pilot to the main by cords from the cable of the pilot to the circumference of the hole in the main. Correctly speaking, the pilot cable should be attached directly to the cable of the main at the point where the lines meet. In this way the load on the pilot parachute would be transmitted direct to the cable of the main instead of through the fabric of the main. But there are obvious practical objections to this.

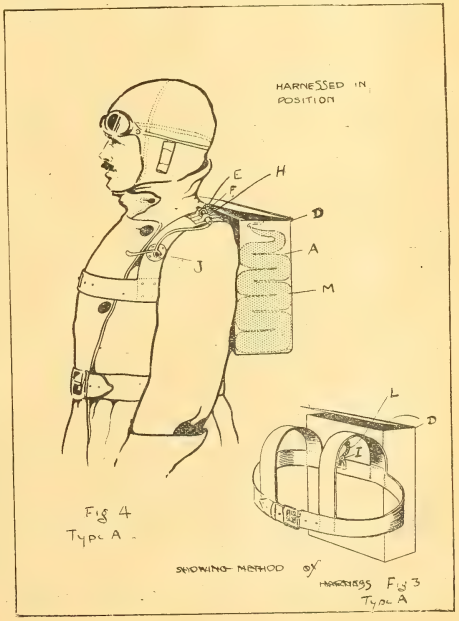
The writer has already successfully employed this compound system in his large parachute flares and to adapt it to life-saving parachutes was merely a matter of modifying details and proportions to suit somewhat different conditions. This the writer has endeavoured to accomplish in what he calls the "Autochute."

THE "AUTOCHUTE."

The general arrangement of the "Autochute" was schemed out by the writer comparatively early in the war, but it was not until last autumn when the demand for life-saving parachutes became urgent that he started to put it into practical shape. As designed now, it is in two different types.

TYPE A.

(Figs. 3 and 4.)—The main parachute M is carried in a receptacle A, to which there is a spring lid D, which is



normally kept closed by a spring hinge. The main parachute cable is attached by the ring I to the shackle on the harness.

In the first form of this invention the parachute lines were wound on a reel provided with a yoke and the main cable was attached to the yoke at one end and to the harness at the other. This had the effect of keeping the lines more or less taut until they were actually unwound by the pull of the main parachute, and which would no doubt have been an efficient means of preventing the lines getting entangled. But the writer subsequently adopted an entirely different device, which he will describe presently.

Figs. 3, 4, 5 show the general arrangement of Type A.

The cable from the main parachute is first attached to the harness, after which the main parachute is folded and packed into the receptacle.

The cable connecting the main parachute to the pilot parachute is furnished with a ring capable of being detachably secured to the harness by a spring bolt H. This spring bolt is so constructed that under ordinary circumstances it is free to open so that when the pilot parachute is released and inflates, it can pull out the main parachute at once. It is fitted with a small lever J and strong spring on the harness, by turning which the release bolt can be kept from opening, so that the pilot parachute will pull on this instead of on the main parachute, and the latter will not be pulled out until the lever is released.

The pilot parachute is then laid on the top of the main parachute and the box closed, or the pilot parachute may be carried in a small cylindrical case attached to the waist with a pull-off lid, as in Fig. 5.

The modus operandi is as follows (see Fig. 5):—

The pilot parachute N is withdrawn and held in the hand, and the man gets in a position to jump overboard. The instant *before* jumping he releases the parachute, which opens as soon as he begins to fall and draws out the main parachute.

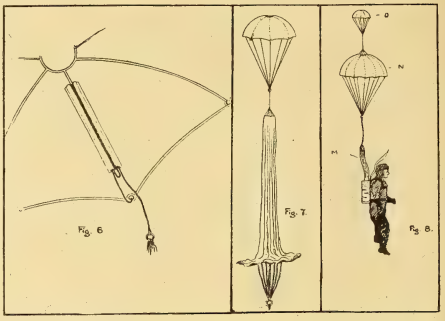
In certain circumstances he may wish to fall for a considerable distance under the pilot parachute only. Thus if he found he was close to the coast and was afraid the main parachute might drift out to sea before it reached the earth, he might wish to fall very quickly to within a few hundred feet of the ground. Or, again, in war time, if the passenger thought the enemy airmen would attack him with their machine guns while falling, he could drop under the small pilot until near the ground, and then release the main.

In this case before jumping off he will turn the lever J on the harness, thereby locking the release bolt so that the main parachute is not withdrawn. Until he releases the lever the main parachute will be retained in its receptacle.

When falling under the parachute a man is apt to grip and cling on to anything that he can get hold of, and the lever locking this bolt is arranged in such a way that he cannot do this, and the moment he leaves go of the lever the bolt will be released.



Fig. 5
Type A



The main parachute is constructed in the following way. Down each seam a double tube of silk is sewn sufficiently long to contain the entire length of parachute line and extending to about 6 inches from the circumference of the parachute. By means of a hooked wire this line is drawn up throught the two tubes in a double loop. (See Fig. 6.) Once this has been done the parachute can be handled, rolled and unrolled as much as desired without any danger of entangling the line. By its use all risk of entangling is absolutely eliminated as can easily be seen.

Moreover, this helps to ensure the quick first stage of opening of the parachute. Owing to the fact that the tubes are not carried down to the edge, the extreme edge is left free until the very last instant when the pull comes on the last bit of cord. The 6 inch round the circumference is then as it were pulled down in the wind and inflates instantaneously. (See Fig. 7.)

As has been pointed out already, there is much less suction from the aperture at the apex or the centre of the parachute than there is with a single parachute, the reason being that during the withdrawal of the main parachute there is hardly any motion of translation of this parachute beyond a leisurely fall of a few feet per second, due to its weight acting on the pilot parachute.

At the moment the cords become taut the strain falls on the pilot parachute, which acts as a brake on the whole system and lessens the shock when the main parachute opens to full expansion a moment later. Thus the shock due to the coming into action of the parachute system is divided into two portions separated by a fraction of time from one another. For this reason it seems probable that shock absorbers will be quite unnecessary in the compound parachute system. The relative proportion of the two shocks depends chiefly on the relative sizes of the two parachutes.

This suction is one of the greatest dangers in connection with parachutes as it causes a vacuum between the folds of the parachute and effectually prevents its opening. But even such small amount of suction as might be present is entirely eliminated by the device the writer has adopted of closing the central hole with a disc of specially flexible paper. This is arranged to be easily replaced each time after use. It remains intact till the pressure inside the parachute becomes sufficient to burst it. With this arrangement and the system of tubes already described, it matters very little how the parachute is folded, and nothing in the nature of skilled attendance is necessary.

Further, the combination of these two simple devices obviates the use of elaborate and costly receptacles and elaborate systems of folding the lines, which may take hours to carry out, and, in any case, involve great risk of errors unless done by experienced hands.

(To be continued.)

ELECTRIC WELDING.

Alloy Welding Processes, Ltd., of 149, Leadenhall Street, E.C., have issued an interesting catalogue dealing with special flux-coated electrodes for arc electric welding, and with the work which can be carried out therewith.

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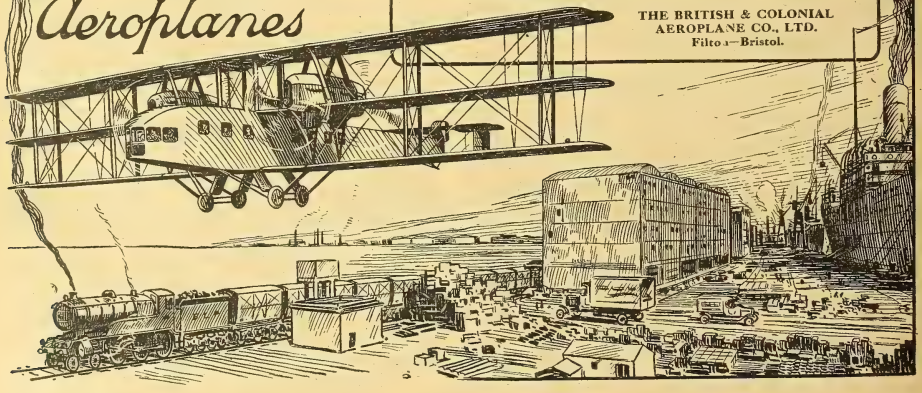
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At first thought one might be tempted to imagine that the only essential to such a business was a first-class pilot, but if that pilot enjoys anything approaching a clientéle, the matter is not so simple as all that.

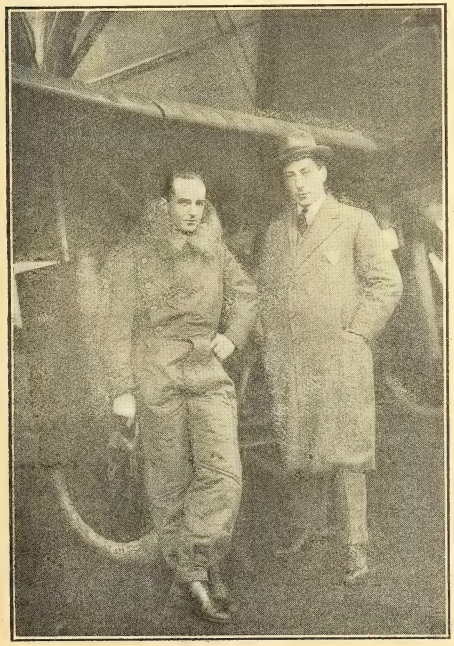
In the space of one week he may find his work in a dozen different places distributed impartially all over England, and it is necessary, if he is to get through a quarter of his work, that all his arrangements shall work like clock-work.

Mr. Clifford B. Prodger, therefore, who is the principal pilot of the firm has in association with him Mr. Bernard Isaac, who is as skilful as an organiser as his partner is as a pilot.

The amount of detail work which is necessary for Mr. Isaac to do to keep Mr. Prodger working without delay is quite amazing. It is necessary for him to reserve for his pilot seats in railway trains, beds in hotels, conveyances at stations, and similar conveniences. It is also necessary for him to keep in constant touch with every firm for which testing is being done for weeks ahead. Should the work at one firm be held up, and Mr. Prodger be kept waiting while the machine was being got ready for trial, it would cause endless delay with work for other concerns. By keeping in active touch with each machine which is being prepared for test, and by finding out whether it is absolutely ready, and that the engine has been run, Mr. Isaac is able to prevent wastage of time.

From time to time, when pressure of work is unusually great, Mr. Prodger is assisted by other proved test pilots.

During the period of the war the Prodger-Isaac Aviation Company has been responsible for the experimental tests of machines of every type, including large and small land machines, and large and small seaplanes. The fund of knowledge acquired by Mr. Prodger is at the disposal not only of firms who are engaged in building new machines, but of firms who contemplate designing new types, and who wish to know what to avoid. The future services, therefore, of the Prodger-Isaac Aviation Company, not only as testors, but as practical technical consultants, should be invaluable to the Aircraft Industry.



Mr. Clifford B. Prodger and Mr. Bernard Isaacs.

TO PLUG BUYERS.

Messrs. Léo Ripault and Co., of 1, King's Road, St. Pancras, London, N.W.1, state that they have now obtained from the printers their latest temporary retail descriptive list, illustrating the various types of plugs which they are in a position to deliver quickly, and would be glad to hear from any inquirers.

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A POST-BELLUM BY-PRODUCT.

The Air Navigation and Engineering Co., Ltd., Blériot and Spad Works, Addlestone, Surrey, have designed and are putting into production a two-seater light car to be known as the "Blériot Whippet," possessing a number of interesting features.

The car is fitted with an 8 h.p. two-cylinder air-cooled "Blackburne" engine, chain driving a countershaft gear. Transmission to the back axle is by an enclosed belt drive. The change-speed gear is of the infinitely variable type—though no particulars as to whether it is of the pulley or the friction type are given.

The springing is of the semi-cantilever type, and it is claimed that the proportion of sprung to unsprung weight is such that the car will hold the road comfortably at all speeds.

The car has a track of 4 ft. 2 ins., and a wheel base of 6 ft. 9 ins.

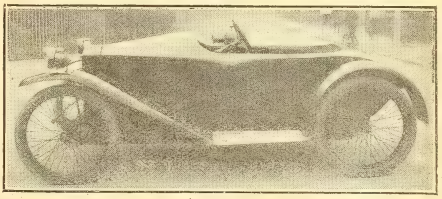
Detachable wire wheels with 700 × 80 mm. tyres are fitted.

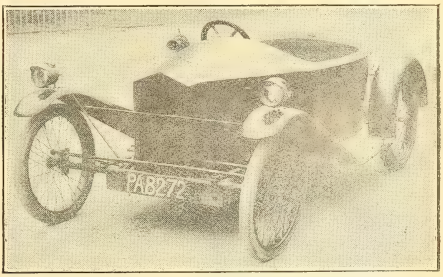
The gear and hand-brake levers are central, and pedal clutch, accelerator and brake controls are fitted.

The foot-brake is a shoe on the rear axle belt rim, and the hand-brake lever controls an internal expanding brake on the countershaft.

The clutch is of the three-plate floating disc type housed in the engine fly-wheel.

The price has been provisionally fixed at £175, and it is hoped that deliveries will commence in August or September next.





Two Views of the Blériot-Whippet Light Car.

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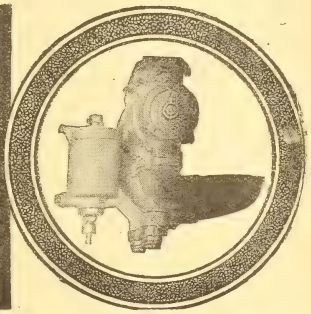
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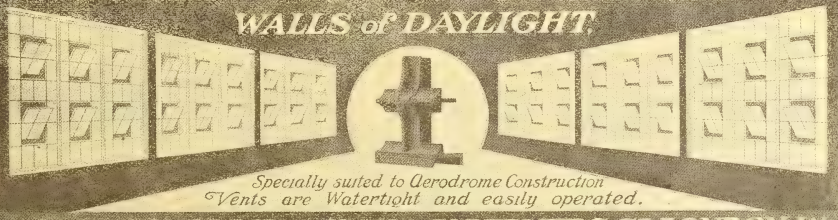
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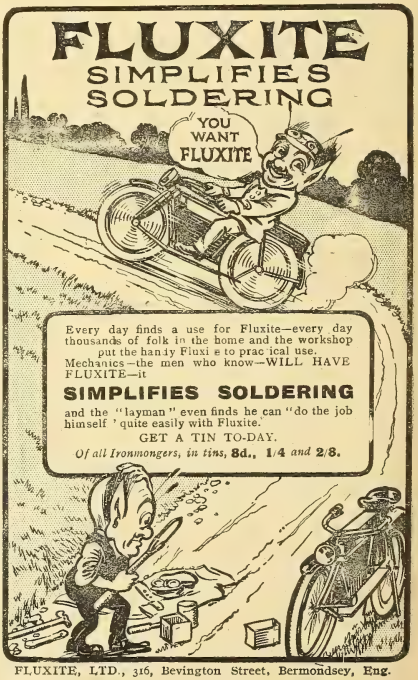
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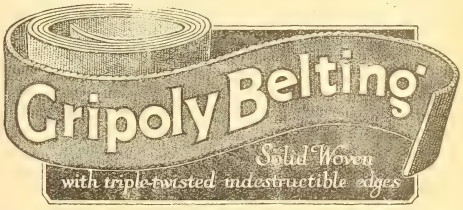
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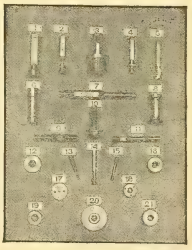
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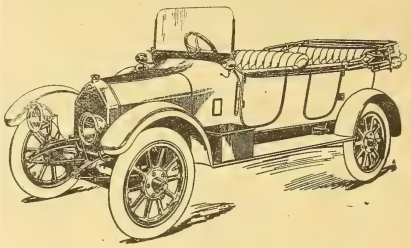
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A. 193

COMMERCIAL AERONAUTICS & CIVIL AERIAL TRANSPORT

INDIRECT PROFITS.

By "MEDWAY."

I notice in a recent issue of The Aeroplane that one of the big hotels in Atlantic City is providing an aerial service to bring guests to its doors from their homes. The news particularly interests me because I have had this use of the aeroplane in mind for a very long time past. In fact, if I possess such a person as a reader who took the trouble to peruse what I wrote eight or nine months ago, and in spite of that still remains a reader, he may conceivably remember that I went into some considerable detail a long time back on this subject.

Doubtless the news item about the Hotel Fraymore of Atlantic City is abbreviated and does not represent the entire scheme. Obviously, if an hotel proprietor is going so far as to run an aerial service of his own, he will also provide thoroughly good facilities for guests who come and go on their own private aeroplanes. In fact, this would very likely prove more profitable than the aerial service. They will need supplies and attention for themselves as well as for their machines, and there is a profit to be made out of everything that is done for either of them.

The Ideal Situation.

My idea of the ideally situated hotel for aerial development is one which either possesses a lake in its private grounds or is quite close to a sheltered bay or harbour on the surface of which seaplanes can alight. There is room for a good deal of enterprise and ingenuity in the provision of facilities for alighting and departure, whether the visiting machine is equipped with wheels or with floats.

A Matter of Principle.

I do not, however, propose to repeat in detail what I tried to suggest months ago. I would rather draw attention to the somewhat important matter of principle. When an hotel proprietor starts an aerial service he does not do so with the prime object of making that service a financial success on its own account. If he can succeed so far as to do so, well and good. If not, the service may still be worth running.

What he is chiefly playing for are indirect profits. Of these, the least indirect is the profit to be made for the hotel itself out of the visitors who are brought by aeroplane. These would no doubt be considerable. The bare fare would not be all the guests would have to pay for the privilege of reaching the hotel. Doubtless the most expensive rooms would be allocated to them at somewhat inflated cost, and in general they would be treated as a country inn used to treat, and sometimes still treats, motorists. In other words, they would be treated as people of wealth and of reckless disposition, well suited to be plundered by the honest tradesman.

In point of fact, it would probably only be the very well-to-do pilot, or the highly prosperous business man, who would be attracted; but, despite taxation and the inroads of Socialism, there remains enough in these classes to give good possibilities of success.

Indirect Profit.

The next indirect profit is that which can be made by charging dues for the landing of private aeroplanes and high prices for their supplies, for any work needed to be done upon them, and for the incidental services of the aerodrome staff. The profits made in these ways would go a long way towards paying for all the supplies required for the aeroplanes used in the hotel's own service.

Next, but not least, we have the advertising value of the whole proposition. The inauguration of the service would be accompanied by notes and comments in practically every journal in the country and a good many outside it. The name of a hotel would become a household word, and this is worth a good deal of money to the hotel proprietor. Probably he could knock off all his other advertising and balance the saving thus secured against the costs of his aerial service, and in the end be a great deal better off than he was before.

The next point is that the kind of people who would be attracted by this scheme would, to say the least of it, be cheery. An hotel, twenty-five per cent. of the guests of which come by aeroplane, would never be dull or frowsy. The chances are that life within it would be given a fairly frequent fillip in the way of an attractive bit of scandal. All this, combined with the useful publicity obtained, would create just that atmosphere that would popularise the place among people who are out to spend money and to have a good time. Even those who do not care to fly would come by motor or by train. The hotel would get a reputation for smartness and its guests for lavish expenditure. The hotel proprietor would reap the profits.

An Excellent Example.

The whole thing is, in fact, an excellent example of dependence upon indirect profit. There are many points of view that may be taken when the starting of an aeroplane service is contemplated. One may go out merely for direct profit, charging fares accordingly. If, when all the costs have been reasonably estimated, we come to the conclusion that the fares, to show a profit, would have to be more exorbitant than anyone would pay, then it does not in the least follow that the project must be abandoned.

Suppose we assume that if we charge the maximum fares consistent with decent patronage of the service, we shall show a loss of £5,000 a year. The next thing to ask is whether, if we start the service and face this loss, we can expect to get back more than that amount in some other way. The most obvious opportunity is in the direction of publicity. The next most obvious is so to arrange matters that the fare is not the only payment that we get out of the people who travel. From both these points of view the hotel proposition is absolutely right, provided that the accommodation available in the hotel is big enough and smart enough to carry the thing through.

A Municipal Service.

It is not, however, the hotel proprietor only who may be justified in aerial speculations on the grounds of indirect profit. An enterprising municipality in a district possessed of natural and artificial attractions would find it well worth while to look into the proposition from a

similar point of view. It might be a bit difficult to get the ratepayer to see the point, but I believe there are many districts in which, by incurring a loss of £5,000 or £10,000 on the running of aeroplanes each season, the town or district could be so far popularised as to enable the average ratepayer to pay his increased rates and to have a bigger income left over after doing so.

There are plenty of most attractive places which are at present a little bit too far from the big centres of population to be patronised on a really big scale. The aeroplane will bring them nearer, will get them talked about, and will introduce just that type of visitor whose presence will draw others in his or her train. If, for instance, various places in Wales, in Devon and Cornwall, and in Ireland do not appreciate these facts, in my opinion they will be losing a very big opportunity.

U.S. AERIAL MAIL PROFITS.

The Washington to New York Aerial Mail Service completed its first year of operation on May 15th last. An official report has been issued by Mr. Otto Praeger, the Second Assistant Postmaster-General, as to the results of the year's working.

According to Mr. Praeger, a total of 128,037 miles was flown on this route at a total operating cost of $142,881. This includes the cost of one machine totally destroyed on trials, but it is not stated whether capital charges, depreciation, and the like are included.

A total of 193,021 lbs. of mails were carried, and for this service a total revenue of $159,700 was received.

Thus the operating cost of the service was $1.12 per mile (4s. 8d.), and the revenue $1.24 (5s. 2d.) per mile. The average revenue for mails works out to $0.84 per lb., or 5.25 cents per oz. (2⅝d. per oz.).

The gross profit on the undertaking is $16,819 for the year.

The "New York Times" of May 15th gives some statistics as to the service. The journey, New York to Washington, is flown in two stages, New York to Philadelphia and Philadelphia to New York.

Ten pilots during the year flew a total of 804 of these stages, or a total of 91,566 miles. Of these 804 journeys 782 were completed without untoward incident, 10 were completed after intermediate forced landings, and 12 stages were not completed at all.

It may be assumed that, in accordance with standard American practice, these figures are chosen from the whole to make the best possible showing, and that the 36,471 miles, representing the difference between the 91,566 miles mentioned above and the total flown in the year, but not accounted for in these figures, would reveal a very much larger number of incomplete or delayed journeys.

Nevertheless, even if the whole of this 36,000 odd miles were entirely composed of incompleted journeys, this gives the efficiency of the service as 70 per cent., and the figures, if accurate, show that it is possible to improve very considerably upon the figure of 60 per cent. put forward by the British Postmaster-General as that which could be obtained in an Aerial Mail.

It is of particular interest to note that the preliminary attempts at this service were carried out with converted war type aeroplanes, with very poor results. These machines were soon abandoned in favour of machines designed for the work and for a moderate all-round performance.

AN INTERNATIONAL AIRCRAFT EXHIBITION.

An International Aircraft Exhibition will be held at Amsterdam during August, 1919.

There will be a British Section, comprising the following groups:—Historical, Department of War, Marine Department, ordinary aeroplanes, seaplanes, motors, motor-cars and motor-cycles, aeroplane building, photography, maps and literature, telegraphy and telephone, orientation and lighting, implements, meteorology, experimental aeroplanes, medical branch, clothing, equipment and heating.

The Exhibition is being organised by prominent technical experts in Holland. The Chairman of the General Committee is General Snyders, formerly Commander-in-Chief of the Netherlands Land and Sea Forces, assisted by Flight-Commanders A. Plesman (as acting manager) and Lieut. M. L. J. Hoftsee (as secretary). All the Dutch Ministers of the Crown are honorary presidents, and are taking a leading part in the work.

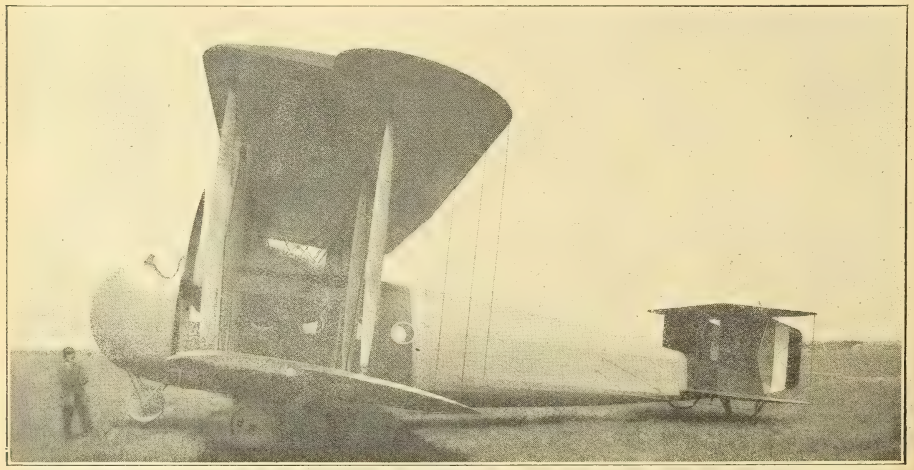
The British Section will be fully representative. Many of the leading firms of constructors have promised their co-operation. It is being realised that there is a great opportunity for British industry to show on the continent to the visitors to the Exhibition, who will be drawn from all parts of the world, that Great Britain is playing a leading part in aviation.

It is understood that the British Government has declared itself in great sympathy with the formation of a British Section, and has recommended it. The matter has been referred to the Comptroller-General of Civil Aviation, who has viewed the proposal with great interest and who considers that such an exhibition should prove of the greatest assistance to British manufacturers and should do much to promote the interest of British commercial aviation. The Comptroller-General is anxious to do all in his power to make the British Section of the Exhibition a success and intends to take steps to make it as representative as possible. Only the Allied countries are invited to exhibit.

At the invitation of the General Committee, Dr. W. R. Bisschop, of 2, Dr. Johnson's Buildings, Temple, E.C.4, has in an honorary capacity undertaken the supervision of the work connected with the British Section, while Mr. J. Vandersteen has been appointed organising manager of that Section. Temporary offices have been obtained at Trafalgar Buildings, Trafalgar Square, W.C.2, where full information can be obtained.

A SEAPLANE SERVICE.

A seaplane service from Southampton will be started shortly to take passengers around the Isle of Wight. It is to be worked by A. V. Roe & Co., Ltd., and the pilot is to be Capt. F. Warren-Merriam, A.F.C., R.A.F.



Side View of the Vickers "Vimy" Commercial Machine (two 375 h.p. Rolls-Royce Engines) described on page 2328.

First Aircraft Exhibition, Amsterdam
AUGUST, 1919.

In view of unaccounted rumours it is now officially notified that

No exhibits of enemy origin will be admitted and that the exhibition is exclusively limited to entries from Allied and Neutral countries.

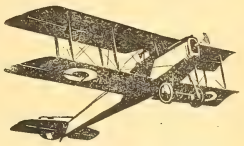
The Exhibition will open on the 1st August, 1919.

Owing to the limited amount of space in the British Section, exhibitors who have not yet done so are urgently requested to send in their applications without delay.

A certain amount of space will be available for the exhibition of motor cars and accessories.

Any information required may be obtained from the London Offices, Trafalgar Buildings, Trafalgar Square, W.C.2. Telephone: Regent 2648.

FOR THE MOST HAZARDOUS WORK OF THE WAR



For aerial warfare, the most hazardous work of the war, and the work upon which successful strategy so largely depended, the *only* spirit used by the British Forces the world over, from the outbreak of the war till the summer of 1917 (when the demand exceeded the supply), was

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FLYING AT HENDON, 1919.

None can doubt that the London Aerodrome at Hendon has vast possibilities as a centre at which to educate the people of the British Empire in general and of London in particular to a proper appreciation of Civil Aviation. Likewise, none who knew Hendon as it was before the war and who visited the aerodrome during Whitsuntide can have any hope of those possibilities being fulfilled unless and until the methods of running the aerodrome and the entertainment which it professes to provide are entirely altered.

If the shade of the late and ever-to-be-regretted Richard T. Gates did happen to be at Hendon during the alleged entertainment at Whitsun he must have smiled his most sarcastic smile when he compared what was being done in the year of grace 1919 with what he and his able coadjutor, Mr. Bernard Isaac, used to do five, six or seven years before, when flying was supposed to be in its infancy. Of course, one is quite prepared to make all due allowance for the fact that the aerodrome has only been in civilian occupation for a few weeks. But curiously enough it is not the things which take time which are wrong, it is the things which take knowing-how.

The railings are all in place, the enclosures are all nicely arranged, there is a better tea-shop and pavilion than ever there was—seeing that it was built as solid R.A.F. quarters and that the R.A.F. officers have been evicted into wooden huts at the other end of the ground in order to make room for the expected crowds of holiday-makers. Our old friend, Mr. Plant, is in charge of the gate. The megaphone man is there with unabated strength. The R.A.F. band makes quite reasonably good music—much better than the Coke-Crusher and Gas-Jet band which used to perform before the war. In fact, everything in the garden is lovely, till one gets to the object with which one has visited the place, namely, to see some post-war flying, illustrative of the advances made in aviation during the war

What Went Ye Out For to See?

One starts with the programme, for which the public are charged threepence, apparently so that they may learn how many Rolls-Royce cars Mr. Grahame-White has for sale. With due diligence one finds a list of the entrants for the races on Saturday and Whit-Monday—one race on each day. They comprise two Avros with 110 Le Rhônes, a Grahame-White single seater (called a "Bantam") with an 80 h.p. Le Rhône, an Airco with a 90 h.p. R.A.F. (which is a demobbed D.H.6 with flat planes—quite a useful civilian aeroplane), and one of the Bat Company's original Bantams, with an A.B.C. Wasp engine.

One looks out over the aerodrome and one sees three or four aeroplanes painted hideously in yellow and blue like a travelling showman's vans. The planes and tails are blue. The fuselages are yellow, so that seen from a distance they remind one of the flags used in military camps to indicate the whereabouts of an item in camp lay-out which we are supposed to have borrowed from the Turks. One feels sorry to see erstwhile elegant war machines thus disfigured.

During most of the afternoon these machines are more or less busy carrying passengers. There seems to be quite a fair demand for "joy-rides." Most of the passengers are taken up in Blackburn "Kangaroos," long, thin twin-engined biplanes, which seem to fly uncommonly well, and, though a humourist in the R.A.F. remarked "they look like badly-nourished Handley Peges," they are said to be very strong and to control particularly easily, qualities which make them eminently suitable for their jobs.

At intervals a Mr. Chamberlayne careers about the aerodrome on the Grahame-White single-seater—also disfigured in yellow and blue. He is a dashing pilot, but either the side-surfaces of the machine need re-designing or he had a curious way of handling it, for it has an ugly habit of progressing corner-wise for an appreciable time before getting onto a bank when starting a turn.

During the afternoon the race of the day takes place. It is flown from the aerodrome to Bittacy Hill and back, two miles out and two miles home. The machines in getting off head straight at the crowd, do an awkward turn, are seen sideways for a moment as they round the turning-pylon, and the rest of the time they are seen in end elevation. The race takes about a quarter of an hour, and is without any absorbing interest. The handicapping on Saturday was so good that in order to catch the leading Avro the Bat-Bantam would have had to do a matter of 20 miles in somewhere about 5 minutes, which is a speed as yet outside the capability of even Mr. Koolhoven's products.

The rest of the Saturday and all Sunday was devoted to the evolutions of Mr. Chamberlayne, the Kangaroos and the two or three Avros.

Whit-Monday's performance was no particular improvement on those of the previous days, so far as the ordinary spectator was concerned. For those who were on the inside of things the dullness was relieved by the flying of the Bantam Bat, which, piloted by Mr. Cyril Turner (late R.F.C.), put up a fine speed in winning the one race.

Incidentally Captain Gathergood, on the demobbed D.H.6, finished first, after doing some really good flying, but was disqualified for going the wrong side of a signal flag of whose significance he had not been advised—at any rate he did not know that he had been told about it. Considering the amount of waste timber lying about all the aeroplane workshops in these days one cannot understand why proper pylons were not put up to mark the course.

During the race the engine of a blue and yellow Avro flown by Major R. H. Carr cut out of action just over the railway. He might have scraped back into the aerodrome, but an approaching train decided him to change his course, so he landed on his nose just outside. He was somewhat shaken, but happily was not seriously injured. The blue and yellow eye-offender was abolished.

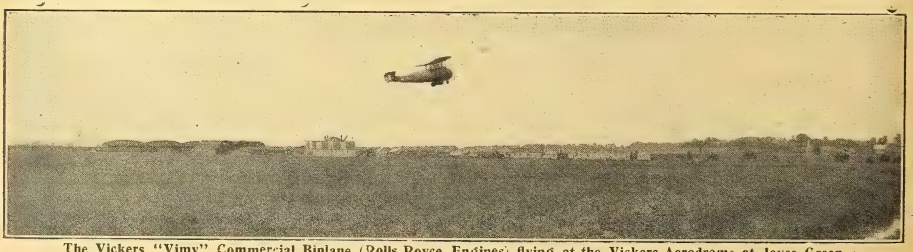
After finishing, Mr. Turner gave a show of very pretty flying on the Bantam, and later Mr. Duke also flew well on the same machine, which is easily the most quickly manœuvred machine of its class. With a little practice in cornering, Mr. Turner will make a very useful racing pilot. Mr. Chamberlayne on the Grahame-White single-seater continued his dashing career. —It might be noted by exhibition pilots that the Air Ministry Regulations distinctly order that flying shall only be done in one direction round an aerodrome. Confidence in aviation is not given to the public by seeing three or four machines cavorting around all in different directions and apparently in imminent risk of collision.

Some Real Interest.

The one really interesting thing on Saturday was a series of trial flights by Major Draper (late R.A.F. and R.N.A.S.), on the big Commercial Bat (Rolls-Royce 375 h.p.), the first machine to be designed and built solely for civil aerial transport. It is quite one of the most beautiful machines ever produced. Its lines are superb, and it is so perfectly proportioned that in the air it looks quite a small machine.

A remarkable thing about the machine is that no *mis-au-point* has been needed. It flies exactly as it came out of the shop in accord with the drawing-board. There has been no adjusting of surfaces nor altering of rigging. But the late Mr. Peter Legh and Major Draper agree that it is absolutely perfect on its controls. The only alteration needed anywhere has been in the arrangement of the radiators, which were purely experimental in any case, and these have needed very little moving. Despite the outstanding successes of the "Bantam" and the "Basilisk," and the Ack-Ws. and the pre-war Deperdussins, one is inclined to think that the Commercial Bat is the crowning achievement of Mr. Koolhoven's genius.

On Sunday morning Major Draper took Commander Towers (N.C.3), Lieut.-Commander Bellinger (N.C.1), another officer of the U.S. Navy, and Lieut.-Col. Spenser Grey (late R.A.F.), in this machine to lunch at the R.A.F. mess at Joyce Green and brought them back in the afternoon. They were all delighted with the machine, which, in the words of one of them, is "Cer-



The Vickers "Vimy" Commercial Biplane (Rolls-Royce Engines) flying at the Vickers Aerodrome at Joyce Green.

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tainly *some* ship." The speed of the huge machine may be gauged from the fact that Mr. Cyril Turner, who accompanied them on the Bat-Bantam with a 170 h.p. A.B.C. engine was unable, so far as could be seen, to catch them when he started behind them nor to get away when he started in front. And the little Bantam is well up among the 120 m.p.h. class.

What Hendon Needs.

However, to return to the matter of the London Aerodrome. One has given one's impressions just as one received them, in the hopes that they may indicate to the propietors just where improvements are needed. One wants to see Hendon the hub of British Aviation, the place to which everybody will go when they want to see first-class flying or the latest types of aeroplanes. It was so before the war, and it may become so again under capable management. But at present it is rather duller than ditchwater, for there, at any rate, one may see expert swimming by æsthetically coloured animalculæ, and one is not offended by primary colours nor by elementary antics.

If the proprietors do not feel justified in paying a number of expert pilots as they did before the war—which seems reasonable with aviation in its present precarious state—one would suggest that they might buy up a number of Pups, Camels, S.E.5s., D.H.4s., R.E.8s., and such machines, cheaply at the Air Ministry Sales, and offer the use of them at a nominal fee to demobbed R.A.F. pilots who would like to do a little flying on Saturdays and Sundays. This would, at any rate, ensure some pretty flying and some variety in types of machines, which would keep visitors amused. Also it would provide entries for the races, for most of these sportsmen would like to have the chance of winning back the price of the hire of their machines.

Furthermore, the course for the races should be properly laid out so as to give the public the best possible view of the machines as they enter and pass along and leave the aerodrome. At present the arrangement is just about as wrong as it can be as well as being dangerous.

Still further, if there is going to be a programme let it be done well or not at all. The public wants to know something about flying as it is, and does not want to pay for pictures dug out of pre-war programmes nor for catalogues of Mr. Grahame-White's cars.

Support from and for the Industry.

Again, encouragement should be given to other firms to send their machines and pilots to fly at Hendon, in order to draw a gate. Even if shed accommodation has to be given free, and if no landing fees are charged for outside machines which come to give exhibition flights, and if no percentage is charged on passenger flights given in such machines, it would pay the aerodrome in the end, because the aerodrome must succeed or fail on its gate-money, and not on what it makes out of "side-lines."

Lastly, if the London Aerodrome is to obtain the support of the Aircraft Industry—which it must have if it is to become the hub of British Aviation—it ought to be under separate management from the Grahame-White Co., Ltd., makers of aeroplanes and dealers in motor-cars. It is as impossible for an aerodrome to be run successfully by a manufacturing concern as it would be for this paper to succeed if it had any interest in any firm concerned with the making of aircraft, their parts, or the material thereof.

No manufacturer is going to put money into a competitor's pocket, and if the London Aerodrome tries to run on such lines it will be found that all the manufacturing firms and passenger-carrying firms, and air-line firms, will take their experimental machines, or their "joy-ride" shows, or their terminal stations to some independent aerodrome, such as either the R.A.F. Civil Aerodrome at Hounslow, or the Brooklands Aerodrome, when it is opened again.

It remains to be seen whether the proprietors of the London Aerodrome will make Hendon the great aerial show-ground of the British Empire, or merely a kind of miniature Coney Island appended to a firm manufacturing and dealing in aircraft and motors. Unless the present system of management is altered it will certainly not be the former.—C. G. G.

CIVIL AERIAL TRANSPORT NOTES.

UNITED KINGDOM.

A regular air service to Paris for passengers and goods has been organised by Aircraft Transport and Travel, of which General Festing is managing director. Airco machines will leave London at 4 a.m., arriving in Paris at 6 or 6.30 a.m., and cargo to the weight of 900 lbs.—consisting of newspapers or light urgently consigned goods may be carried. There will probably be space also for a passenger or two.

Flying in Lancashire.

According to the "Liverpool Echo" the "Birkdale Palace Hotel will commence a private service with several Avro machines. Guests who book rooms from the Isle of Man or Blackpool and wish to come by air will be waited upon by hotel aeroplanes." The term waited upon by hotel aeroplanes seems to need explanation.

Over a thousand passengers were carried in Avro machines at Blackpool and Southport during last week. Some passengers have become so enthusiastic about flying that they take the air regularly every day. Many have experienced all the thrills of looping, rolling, and spinning, and now want fresh sensations. sensations.

The Manchester-Blackpool service has been running twice daily despite heavy mist at Manchester on several occasions. High tides at Blackpool have somewhat curtailed flying, but the increase in the number of machines available —12 being now in commission—has enabled the amount of flying done to cope with the demand from passengers. All types of passengers, from children of 4 or 5 years to old men and women of 60 or 70, have made flights, and some have done as much as two or three hours in the course of the week.

A steady demand for long distance cross-country flights is springing up, but until fresh aerodromes are opened at popular centres these journeys cannot be executed. Flying both at Blackpool and Southport has taken place regularly without a day being missed for the past three weeks, and so far not a single accident has been recorded. A couple of broken tail-skids is the only damage to the machines.

Flying at Hounslow.

On June 4th, in spite of Air Ministry restrictions, 44 passengers were taken from Hounslow Aerodrome to a landing ground at Walton Heath Golf Club. Seven machines were employed. Cars took the passengers from the landing ground to the course, at Epsom, and all arrived in good time for the races.

Owing to the landing ground not being licensed, passengers were taken free. The weather conditions were most unfavourable, and just between four and five p.m., when the passengers began to return from the course, it was practically impossible to return owing to land fog and very low clouds. In spite of this the machines flew in formation back, taking thirty passengers to Hounslow. The remaining passengers were sent to London by car. These machines did three trips in formation.

The following cross-country flights were successfully carried out during the week:—One to Frinton-on-Sea; two to Hastings; one to Llandudno. In each case return flights were made.

Three machines left Hounslow on Saturday, the 6th inst., with passengers for the week-end for Margate. These machines flew at Manston Aerodrome during the week-end.

An interesting incident showing the use of aeroplanes for quick repairs took place on Sunday, the 7th inst. An Avro machine required urgent repair at Kingwood. Colonel Henderson left Hounslow by air at 8.15 a.m. for Ringwood. He refitted a magneto and despatched the repaired machine on its flight to Bournemouth, and was back at Hounslow Aerodrome at 10.45 a.m., a distance of 180 miles having been covered.

Five out of six of the pilots employed at Hounslow appeared in the Birthday Honours List on June 4th, four being awarded the Air Force Cross and one the Distinguished Flying Cross.

SCANDINAVIA.

A Commission composed of one representative each of Sweden, Denmark, Finland, and Norway to formulate a scheme of common air traffic legislation has been suggested by the Inter-Scandinavian Air Conference at Christiania.

The first official Scandinavian Air Traffic Conference, which began its sittings at Stockholm on June 2nd, closed on June 5th after discussing a scheme for the regulation of aircraft traffic for the four Scandinavian countries, including Finland.

The Conference recommended that common rules should be adopted for the granting of certificates for the efficient of aeroplanes and seaplanes, and discussed the question of the qualifications of applicants for pilot certificates, took into consideration various schemes for promoting air traffic, and asked the Governments concerned to nominate as soon as possible a Scandinavian Committee of experts, one for each country, to work out the details and draft a scheme of inter-Scandinavian legislation.

Finally, the Conference expressed the wish that the four Governments should come to an agreement with other nations to promote international air navigation.

By Error Again.

Owing to an unfortunate printer's error an illustration of the experimental Austin triplane which appeared in this paper recently was called an Austin biplane. A domesticated Naval officer points out that if the person who wrote the inscription had been a married man he would have had a better appreciation of the difference between two and three. One tenders apologies to readers of this paper for the error.

A SALE OF FABRIC.

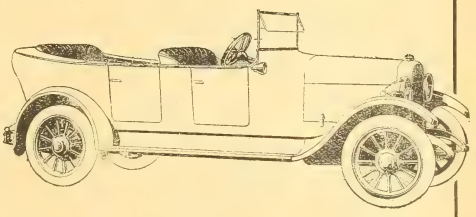
The Aircraft Equipment Board, Disposal Section, Kingsway, W.C.2, are selling quantities of aeroplane fabric. The width of the material varies from 36 inches to 74 inches, and the price is from 1s. 8d. a yard to 4s. 6d.

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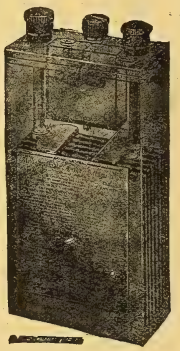
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AIRCRAFT FINANCE

PERSONAL INSURANCE OF PILOTS.

Insurance of Pilots.

It is very satisfactory to observe that the basis of aviation insurance is gradually broadening. True, one hears very little about the policy and intentions of the Tariff Offices. Stimulated by the action of the few enthusiasts at Lloyd's in creating a new venture to deal exclusively with aircraft, they also decided, it will be remembered, to enter the new sphere. There is a suspicion that they are purposely going "dead slow," hoping to benefit from the experience of the pioneers, and are not pushing aircraft exclusively, but treating the risks as a side line capable of bringing in general business.

Association with Shipping.

In these circumstances the recent appearance of the Aviation and General Insurance Company is to be welcomed. As implied by the title, it is to specialise in the business and must do some pioneering. It is sponsored by Lord Furness of the big shipping combine with ramifications everywhere. Apart from admiration of the spirit of enterprise on the part of the shipping magnate, one is particularly pleased to welcome the more intimate relationship thus established between the youthful and untried aviation industry and the firmly established shipping industry. Aviation, it cannot be denied, must follow in its development on the experience of the shipping industry, and this will be helpful and beneficial in many ways.

Specialisation.

The Aviation and General Insurance is going the "whole hog" in respect of all kinds of aircraft risks, but it is specialising in air pilots' personal accident business. This is worth noting. The greater the number of specialists the better, because by specialisation perfection is accelerated.

Details of the Policy.

These personal accident policies for pilots are comprehensive enough, it must be admitted. There are four sections, ranging from £1,000 payment at death in schedule A to £250 under schedule D, and combining claims for loss of a limb or of limbs, or an eye or of eyes, as well as compensation over a specified period in respect of total disablement. Alternatively one can cover the risk of death only without providing for the risk of accidents.

A Noteworthy Clause.

All this may appear to be the usual stodgy type of general insurance, but that inference is wrong. It is particularly specified that rebates of premiums are allowed if through sickness or accident the insured is prevented from flying during any period or periods of thirty consecutive days, or in the event of the insured failing to pass any medical re-examination required by the Air Ministry or other authority, subject to there being no claim under the policy and the total premium not being less than £20.

This provision should prove of considerable value and is worthy of consideration. The reservations are clear enough and quite reasonable, as is also that one which limits travel to the United Kingdom and France, it being provided that the area may be extended upon payment of an additional premium.

The Question of Costs.

The question of the premium is, of course, determined by the physical condition of the pilot, coupled with his or her qualifications, which, of course, is an important factor, just as the nature of the flying, which also enters into the calculations. A pilot with a clean record and first-class qualifications naturally expects better treatment than one subject to trouble and accidents.

A Multitude of Queries.

Conceivably the questions asked in the proposal form will provoke sarcasm. This is the case ever since aviation insurance became a reality, and really they seem to be too personal to the modest individual. But one must regard the matter from the point of view of the people accepting the risks. It is their business to accept reasonable risks at a reasonable premium, and therefore they must safeguard themselves against any physical or other deficiencies of the insured.

Aero Club and Arbitration.

An interesting feature that will please many people is that these pilots' personal accident policies are issued under the approval of the Royal Aero Club. Not only is this a novelty in some respects, but it is very significant that the Aero Club should take an active interest in this necessary branch of aviation.

As a matter of fact, it is specified in the policy that, should any question or difference arise under the policy, the matter shall be referred to an arbitrator appointed on the application of either party by the Committee of the Royal Aero Club.

All Kinds of Aircraft Risks.

The authorised capital of the Aviation and General Insurance Company is £1,000,000, of which £500,000 is subscribed and £100,000 paid up. It would be a mistake to suppose that because it is specialising in pilot insurance it is not so keen on other risks. On the contrary, it is out to develop aviation insurance business generally, including loss or damage to aeroplanes, third party indemnities, passenger insurance, passengers' effects, cargoes, postal packets, and accidents to persons or property caused by aircraft, etc. Thus the range of business is comprehensive, and this must be borne in mind.

Wm. J. Davies.

CURRENT TOPICS.

After the New Funding Loan.

Once the new Funding Loan is properly masticated and thoroughly digested the Financial World will be in a healthier condition. Therefore, it is imperative that everyone should help towards that desirable end, for the sooner normal business and industrial conditions are restored the more comfortable will things become. Reconstruction can then be proceeded with, not in the half-hearted, uncertain manner as now, but seriously, and with a hope of ultimate success. At present the Financial World may be likened to the small boy who ate too much pudding.

Cheerfulness not to be Expected.

Until the operation is out of the way there is not expected to be much activity or cheerfulness on the Stock Exchange, nor will it be so easy to raise the requisite money for financing new schemes. The stagnation is already apparent, and one finds little of interest to chronicle in relation to fluctuations in Aircraft and kindred securities.

Morane-Saulnier Profits.

The French Morane-Saulnier Co. reports a net profit for last year of 245,961 francs, compared with 755,388 francs for 1917, after providing 1,288,188 francs for war profits tax. It is pointed out that during the five years of the war the company has dealt with work to the value of 61 million francs, on which the profit approximated 10 million francs. Of this the State has taken 5½ million francs in the form of taxes. The dividend for last year is to be 8 francs per share with 16 francs on the parts.

AIRCRAFT IN PARLIAMENT

The following oral answers were given on May 29th :—

ROYAL AIR FORCE.—SURPLUS AEROPLANES.

Col. ASHLEY asked the Under Secretary of State to the Air Ministry if he will offer to the Overseas Dominions and Colonies some of the surplus aeroplanes now in the possession of the Air Ministry, with a view to their being used for postal and similar services

The UNDER SECRETARY of STATE for AIR (Major-Gen. Seely) : This question is at this moment being considered. Perhaps my hon. and gallant friend will repeat his question next week. Since I drafted this answer a satisfactory conclusion has been arrived at by the Government and I hope to make a satisfactory announcement when the hon. Member repeats his question.

Lieut.-Col. ASHLEY : Will this be given as a free gift or will it be a purchase ?

Maj.-Gen. SEELY : As a free gift to the Dominions, the Crown Colonies, and to India.

Lieut.-Col. Sir SAMUEL HOARE asked the Under Secretary of State to the Air Ministry whether, in view of the high prices now being realised for obsolete and old motor cycles and cars being sold by Government Departments, it would be desirable to offer some of the new aeroplanes, now being broken up by his Department, to the public by auction sale so as to test the market on this matter.

Major-Gen. SEELY : The aeroplanes which are being reduced to produce are those which are obsolete for war purposes and unsuitable for civil aviation His Majesty's Government accordingly could not accept the responsibility of putting them on the market The responsibility of the Air Ministry ends when they have decided what machines are surplus and which of them are obsolete for service use and unsuitable for civil aviation. Thereafter the question of disposal rests with the Disposal Board under the Ministry of Munitions.

Lieut.-Col. S. HOARE : Why could not the right hon. gentleman put some of these on the market to see if there is a demand for them, and at the same time make it clear that any purchaser purchases them at his own risk ?

Major-Gen. SEELY : That is a matter for the Disposal Board of the Ministry of Munitions, and questions on that subject should be addressed to them.

Lieut.-Col. MOORE-BRABAZON : Have steps been taken to dispose of some of these machines to neutral countries for trade purposes ?

Major-Gen. SEELY : I have just announced the decision of the Government to make a free gift to the Dominions, Colonies, and India of those required for certain specific purposes, but the disposal of the machines is a matter for the Disposal Board of the Ministry, and I shall be obliged if the hon. and gallant gentleman will address his questions to them, as they have all the facts at their disposal.

YATE AERODROME (WOMEN AND GIRLS DISCHARGED).

Mr. RENDALL asked the Under Secretary of State to the Air Ministry whether he was aware that many girls and women who volunteered for work at the Yate (Glos.) aerodrome have been recently discharged and their places taken by other women; whether this action is locally regarded as unjust and results in the turned-off women receiving out-of-work donation; whether, as the result of newspaper correspondence, no women received fresh notices on Friday, May 16th, but many girls left that week owing to previous notices and eight or nine fresh ones were taken on; and will he say what justification there is for this conduct.

Major-Gen. SEELY : Apart from compassionate discharges (to which I presume my hon. friend is not referring) I find that thirteen members of the Women's Royal Air Force at Yate were recommended for discharge in April last. The work in certain branches had then greatly diminished and the least efficient workers were selected for discharge where the staff could be reduced. Discharges were carried into effect as regards eight of the women on May 9th and as regards five on the 16th. Forty-seven members of the Women's Royal Air Force have since been enrolled, but only three of them, who were miscellaneous labourers, are of the same trade as those discharged. The women whose places they took were regarded as inefficient. Two civilian subordinates have also been discharged since April 1st and their places taken by two members of the Women's Royal Air Force.

Mr. RENDALL : Will my right hon. friend explain why women are turned off and receive out-of-work donation and at the same time an equal number are being taken on and being paid ?

Major-Gen. SEELY : I have asked for a full report from the officer commanding. I have not yet received it. I admit the point is somewhat obscure. If my hon. friend will repeat the question next week I hope to be able to give an answer.

Lieut.-Commander KENWORTHY : Cannot discharged soldiers do this work instead of women ?

Major-Gen. SEELY : That raises a very big question. Where women are already engaged in doing work well it would be wrong to displace them if they are fully efficient for the work, and more efficient than men would be. It is a big question which I cannot argue at present.

SOUTH-EASTERN AREA HEADQUARTERS.

Lieut.-Col. Sir JOHN POPE asked the Under Secretary of State to the Air Ministry whether the headquarters of the South-Eastern Area is the only unit of the Air Force accommodated in No. 4, Thurloe Place; by what number of officers and men the strength of this unit has been reduced since November 11th, 1918; and how much further it is intended to reduce the strength after the signing of Peace.

Major-Gen. SEELY : With the exception of two officers and three clerks the headquarters staff of the South-Eastern Area is the only Royal Air Force unit accommodated at 4, Thurloe Place. On November 11th, 1918, the total numbers of this staff were sixty-four officers and 105 other ranks; yesterday the figures were sixty-seven officers, 173 other ranks and fifty-six civil subordinates. The increase shown has been made in consequence of the great increase of work due to rapid demobilisation. Thus, while the reduction of the whole force during the period mentioned is : Officers and cadets, 64 per cent., other ranks 74 per cent., an increase is necessary in the staff of the areas in order to complete the great volume of work involved in this rapid reduction, and assist in building up the smaller permanent force.

OCCUPATION OF PREMISES.

Major BOYD-CARPENTER asked the Under Secretary of State to the Air Ministry what is the Statute under which the Royal Air Force occupies premises; and whether an Order under the Defence of the Realm Act issued by the War Office is deemed to be valid in such a case.

Major-Gen. SEELY : The Statute under which premises can be compulsorily taken by the Royal Air Force is the Defence of the Realm Act, Regulation 2, made under that Act, provides for any competent naval or military authority taking possession of any buildings or other property, when it is necessary to do so for the purpose of securing the public safety or the defence of the Realm.

Major LANE-FOX : Has the right hon. gentleman any right to hand them over to the Insurance Commission ?

Major-Gen. SEELY : That is a legal matter. I should presume it must be legal, otherwise we should not have done it.

Major LANE-FOX : Has the right hon. gentleman taken the advice of the Law Officers ?

Major-Gen. SEELY : I am quite sure my predecessor must have done, because he was a most wise man, but I will inquire at once. It was before my time

HALTON PARK CAMP (DISCHARGES OF MEN).

Mr. BRIANT asked the Under Secretary to the Air Ministry whether about 300 men have been discharged during the last month from the works now in progress at Wendover; if the cause for this is the delay in the passing of the plans for the continuation of the scheme; and, if this is so, will he take steps to see that there shall be no further delay involving, as it has, the discharge of many demobilised soldiers.

Major-Gen. SEELY : The recent discharges of men employed on construction work at Halton Park have been due to the approaching completion of buildings.

MISS DOUGLAS-PENNANT.

Sir ROBERT THOMAS asked the Under Secretary of State to the Air Ministry whether he has received a communication from Miss Violet Douglas-Pennant, dated May 3rd, which is a *prima facie* case, such as he required to have before granting the inquiry; whether an answer has been sent to Miss Douglas-Pennant, and whether he will now assure the House that the Government will fulfil its pledge and grant the inquiry ?

Major-Gen. SEELY : The communication referred to has been received and an answer sent. In the view of the Secretary of State, no case for a public inquiry has been made out. He has informed Miss Douglas-Pennant that he is prepared to publish the papers if the House desires it, and has asked what are her wishes in the matter. The Secretary of State has received no answer to his question, and, in view of the Debate which it is desired to have in another place, he has decided to lay the papers at once.

Sir R. THOMAS : Is the right hon. gentleman aware that a Committee of both Houses of Parliament has been sitting to consider Miss Douglas-Pennant's statement with corroborative evidence, and has come to the unanimous conclusion that a *prima facie* case has been established, and under these circumstances will the right hon. gentleman appoint a committee of this House to decide whether a *prima facie* case has been established or not, and not take the responsibility upon himself ?

Major-Gen. SEELY : I will communicate my hon. friend's views to the Secretary of State for War, who is dealing personally with the matter.

HAWKER-GRIEVE ATLANTIC FLIGHT.—RECOGNITION OF DANISH GALLANTRY.

Mr. CHADWICK asked if the British Government has officially conveyed to the captain and crew of the Danish steamer "Mary" its appreciation of their gallantry in rescuing Mr. Hawker and Commander Grieve in mid-Atlantic in a gale

Mr. BRIDGEMAN : An expression of appreciation of the services rendered and the gallantry exhibited in the rescue of Mr. Hawker and Commander Grieve by the captain and crew of the Danish steamer "Mary" will be conveyed to the Danish Government for communication to the master and crew. The Board of Trade are considering what further recognition should be given. I take this opportunity of associating my right hon. friend and the Board of Trade with the general expression of satisfaction at the rescue.

Mr. J. JONES : Can the hon. gentleman tell us whether the Danes are to come under the Aliens Restiction Act ?

BRITISH CELLULOSE AND CHEMICAL MANUFACTURING COMPANY.

Mr L. RAPER asked when the report of Lord Sumner's Committee regarding the British Cellulose and Chemical Manufacturing Company will be forthcoming.

Mr. BONAR LAW : I regret that it is not possible for me to name a definite date, but I hope that it will be ready within a week or two.

AMERICAN AVIATION (TRANS-ATLANTIC FLIGHT).

Mr. GRANT (*by Private Notice*) asked the Under Secretary of State for Air whether, in view of the achievement of American aviators in crossing the Atlantic, suitable arrangements have been made to welcome the flying-boat N.C.4 on its arrival in this country, so that our admiration for the exploit may be publicly expressed.

Major-Gen. SEELY : Yes, Sir. All possible arrangements are being made by the Air Ministry to give fitting reception to these intrepid American aviators so soon as they have completed their course. Our flying-boats and seaplanes will meet them, if possible, and escort them to Plymouth. Our Air Station at Cattewater is arranging to entertain them, and I am informed that the naval, military, and civil authorities will co-operate in every way possible. I may add that my latest information is that the N.C.4 has not yet started. It is expected to start to-morrow.

[This was on May 29th. The leading article this week shows how officialdom keeps its word.—Ed.]

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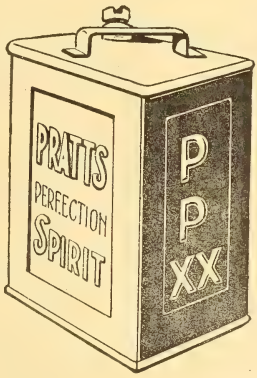
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AERONAUTICS and The LAW

CURIOSITIES OF AIR LEGISLATION.

By "THE LINCOLN IMP."

The Fountain Pen of the Law.

Until after the Armistice "Thou shalt not fly" was the sum and substance of legislative air law. Then came the Aerial Navigation Act, 1919. This is a temporary Act to endure until 1920 only. It empowers a Secretary of State to regulate Aerial Navigation. The only restrictions on the extreme generality of this language are that his powers of regulation are limited to the British Isles and the territorial waters adjacent, and that he is to legislate "by order." As soon as made, his orders are law, but they must be laid on the table of the House and are liable to be annulled on address.

Our Sovereign, on land and at sea, is the King in Parliament. But in this matter of air law the Sovereign has all but abdicated in favour of Mr. Churchill, whose sceptre is a pen. It is a self-filling fountain pen which the Secretary for Air wields, and he supplies his own ink.

The Air Navigation Regulations, 1919.

Mr. Churchill the Lawgiver, in pursuance of his powers, has signed the Air Navigation Regulations, 1919. You have read or glanced over them in The Aeroplane. The Imp regrets to have to record his opinion that the fountain pen has a bad nib. The Regulations are ill-drawn. Not that they do not set forth much that is of value. Not that it could be expected of such an experimental production that it should be above reasonable criticism. But that in fact and in truth the language of the Regulations is often inapt, their meaning obscure, and their form and conception not worthy of the subject.

The Imp is no iconoclast, but recognises that criticism is only valid and useful if directed towards reconstruction. He will therefore not seek to destroy what he conceives to be ill-drawn without suggesting a substitute. But healing treatment may be drastic!

The Art of Drafting.

The Air Regulations suffer from bad conception, bad arrangement, bad drafting, bad grammar, bad law, and bad language. But their substance is not bad.

Mind speaks to mind through the medium of words. The art of selecting the appropriate words and so arranging these words as to convey the mind of the Sovereign to the mind of the subject has the technical name of drafting. Drafting, like all other arts, has its technical terms of art and its technical modes of expression. The draftsman of the Regulations has ignored the art of drafting. It is a rule of this art that any change of expression implies a change in the meaning to be conveyed. The draftsman of the Regulations prefers the literary convention that the repetition of identical phrases is odious. Hence his work is bad drafting. But he cannot plead in extenuation that it is good literature either. For he ignores also the rules of grammar—"The aerodrome at which he departed."

Bad Conception and Arrangement.

The Imp finds the Regulations ill-conceived and ill-arranged. Problems of intention and of evidence are not fully thought out. Principles are not framed and applied with consistency. Penalties are not varied so as to adapt them to the crimes. There is lacking any vision of the Merchant Air Fleet of the future. The arrangement is bad.

Tiring of Regulation No. 1, which is disjointed and long, the draftsman starts a new one "without prejudice" to the last. Tiring of this again, he bethinks him of Schedules, and after inserting a reference to these his mind wanders to the future and he takes power to issue "Directions."

After these little excursions he reverts to the business in hand and regulates aerodromes, then makes safety provisions. Next he jumps to licences, returns to aerodromes and factories, and proceeds to his exceptions, which he places before the penalties from which exceptions have to be made. After a further reference to licences, the draftsman then concludes in the orthodox fashion with Interpretation, Saving, and Short Title. Eight Schedules follow which are just more Regulations.

Bad Classification.

Classification is inartistic when made on more than one principle. A division of "Mankind" into White Men, Women, Airmen, and Lawyers is a cross-classification and bad. The Imp, out of curiosity, has counted the separate principles on which "Aircraft" are classified in the Regulations. He finds them to be 12—viz.: (1) Mode of support or propulsion. (2) Ownership. (3) Registration. (4) Purpose for which intended to be employed. (5) Purpose for which actually employed. (6) Point of arrival or departure. (7) Type. (8) Flying by night or by day. (9) Position relative to other aircraft. (10) Position relative to the earth, air, or water. (11) Position relative to the U.K. (12) Intentions of their pilot and other people. Such a classification is bad.

Redundance and Ambiguity.

Three times is one enjoined in the Regulations that the rules as to lights and twice that the rules of the air must be complied with. On inspection many other redundancies will be found, and the Regulations will be seen to abound in ambiguities. The Saving contains what is perhaps the neatest of these: "Nothing in these Regulations shall be construed as conferring any *right to land* in any place as against the owner of the *land* or other persons interested therein." In spite of its immediate context the first "land" seems to be meant as a verb and not a noun. It is "*adire*," not "*solum*." Here is another: "No aircraft entering the U.K. from abroad shall land *for the first time* in the U.K. except at an appointed aerodrome." Suppose it does not land *for the first time* in the U.K., but for the second or subsequent time. Has an aircraft flying from Paris to Manchester, which lands for the first time at Marquise and next time at a non-appointed aerodrome near Manchester, contravened the regulation

Oversight and Contradiction.

The use of parachutes is expressly forbidden by the Regulations—apparently by an oversight. "When looking up-wind the right-hand one shall be the taking-off zone" (Rules of the Air, No. 40). This zone is the landing-zone in the illustration, and the taking-off zone is on the left. The drawing seems correct and the text must be wrong.

[This has since been corrected by the Air Ministry.—Ed.]

Uninterpretable Interpretation.

Some care has been displayed in drafting the interpretation clause, but without attaining perfection. Let us examine first the best attempts:—

"*Aircraft*" includes airships and flying machines, all balloons whether fixed or free, and kites.

"*Airship*" means an aircraft lighter than air and having means of propulsion.

"*Balloon*" means an aircraft lighter than air and having no means of propulsion.

"*Flying machine*" includes aeroplanes, seaplanes, flying boats, and other flying machines heavier than air, and having means of propulsion.

In the light of these definitions how should we answer the following questions?—

(1) Is a kite-balloon when attached to a moving motor-lorry on land or to a ship in motion on the sea (a) an aircraft, (b) an airship, a balloon, or a kite, (c) a fixed or free balloon?

(2) Is an aircraft lighter than air whose means of propulsion has broken down an airship or a balloon? Which is it when being towed (a) by a lorry or a ship, or (b) by an airship or a flying machine?

(3) What is an airship or a balloon which has become heavier than air?

(4) When is a flying machine not a flying machine? When its engine having seized up, it has no means of propulsion!

(5) What is propulsion? Does it include (a) ascension, (b) retrogression, (c) traction, (d) descent? Are gravity and displacement respectively means of propulsion?

Impudent Alternatives.

In pursuance of his promise that his criticism shall be constructive, The Imp has designed alternative definitions. They are these:—

"*Aircraft*" includes airships, flying machines, balloons, and lifting kites.

"*Airship*" means an aircraft designed to be lighter than air and to have means of self-propulsion.

"*Flying machine*" includes aeroplane, seaplane, flying-boat, and any other flying machine designed to be heavier than air and to have means of self-propulsion.

"*Balloon*" means an aircraft designed to be lighter than air and to have no means of self-propulsion. It includes an attached and a free balloon.

"*Attached balloon*" means a balloon which is attached to some external object. It includes a fixed balloon.

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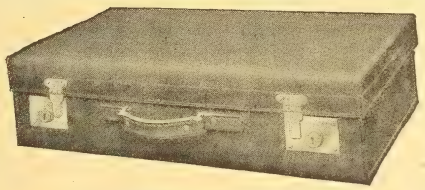
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"*Fixed balloon*" means a balloon purposely attached to some external object designed to be stationary.

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"*Glider*" means a machine designed for gliding-flight only and without means of self-propulsion. It is not an aircraft.

"*Air tow*" means an aircraft in the air and having attached to it a means of propulsion external to itself.

"*Air tug*" means an aircraft in the air and attached as a means of propulsion to an object external to itself.

"*Propulsion*" includes tractive and propulsive motion in all directions, but does not include motion imparted by the winds or due solely to the force of gravity.

(*To be continued.*)

THE ROYAL AERO CLUB.

A Special Meeting of the Committee was held on Monday, June 2nd, 1919, when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the Chair, Mr. Ernest C. Bucknall, Lieut.-Col. John D. Dunville, R.A.F., Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F., Lieut.-Col. Alec Ogilvie, and Mr. H. E. Perrin, Secretary.

New Members.

The following new members were elected:—

Capt. Charles Keith Chase, R.A.F.; Lieut.-Col. Harold Borlase Triscott Childs, R.A.F.; Capt. Joseph Terry Chitty, R.A.F.; Capt. John Dennis Coales, R.A.F.; Capt. Francis Patrick Dickson, R.A.S.C. (M.T.); Major Albert Edgar Gendle, R.A.F.; Capt. Vincent Greenwood, R.A.F.; Capt. Edward Gribben; Capt. Charles Ernest Hilton-James, R.A.F.; Herbert Osborn Lewis; Lieut. Ralph Charles Michaelson, R.A.F.; Major James Herbert Tyler, R.A.F.; Lieut. Philip Basil White (East Surrey Regt.); Capt. Henry Roger de Wilde, R.A.F.

Federation Aeronautique Internationale.

The report of the Conference of the Fédération Aéronautique Internationale held in Paris on May 19th, 20th, and 21st, 1919, was received from the delegates, Lieut.-Col. Mervyn O'Gorman, C.B., Lieut.-Col. Alec Ogilvie, and Lieut.-Col. F. K. McClean. Full details of this report will be issued later.

A unanimous vote of thanks was passed to the delegates who attended the Conference on behalf of the Royal Aero Club.

The Flying Services Fund Committee.

The grants and allowances made by the Flying Services Fund Committee at its meeting on May 28th, 1919, were confirmed.

N.C.4.

The crew of the N.C.4, accompanied by representatives of the U.S. Naval Forces operating in European Waters, visited the Royal Aero Club on Sunday, June 1st, immediately on their arrival in London, and met with an enthusiastic welcome.

In response to a congratulatory message from the Chairman of the Royal Aero Club, the following cablegram was received from Rear-Admiral H. S. Knapp, U.S.N.:—

"The Duke of Atholl, Chairman, Royal Aero Club, I thank you sincerely for your own congratulations and those of the members of the Royal Aero Club on the successful crossing of the Atlantic by the United States Seaplane N.C.4. I shall take pleasure in bringing to the attention of the Commander of the N.C.4 your courteous message.—Knapp."

£10,000 Prize Offered by the Australian Government for a Flight from Great Britain to Australia.

The following entries have been received:—

Lieut. Bert Hinkler: Sopwith "Dove" biplane, 80 h.p. Le Rhône engine.

Lieut. C. Kingsford Smith and Lieut. V. Rendle: Blackburn "Kangaroo" biplane, two 250 h.p. Rolls-Royce Falcon engines.

The Flying Services Fund.

A meeting of the Flying Services Fund Committee was held on Wednesday, May 28th, 1919, when there were present:—H.R.H. Prince Albert, K.G., in the Chair, Mr. Chester Fox, Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F., Brig.-Gen. R. H. More, C.M.G., and Mr. Harold E. Perrin, Secretary.

Chairman.

On the motion of Brig.-Gen. R. H. More, C.M.G., seconded by Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F., H.R.H. Prince Albert, K.G., was elected Chairman.

Grants and Allowances.

The following grants and allowances were made:—

(36) An allowance of £5 a month for six months to the widow of a Leading Mechanic in the Royal Naval Air Service who had been killed on active service.

(47) An allowance of £3 a month for six months to the widow of a Corporal in the Royal Flying Corps who had been killed on active service.

(67) An allowance of £2 a month for six months to the mother of a 3rd Class Air Mechanic in the Royal Flying Corps who had been killed on active service.

(97) An allowance of £2 a month for six months to the widow of a 3rd Class Air Mechanic in the Royal Air Force who had been killed on active service.

(107) An allowance of £1 a month for six months to the mother of a 3rd Class Air Mechanic in the Royal Flying Corps who had been killed on active service.

(118) An allowance of £4 a month for three months to the mother of a 3rd Class Air Mechanic in the Royal Air Force who had been killed on active service.

(179) A grant of £10 to an ex-2nd Class Air Mechanic in the Royal Flying Corps who had been incapacitated on active service.

(193) An allowance of £4 a month for 12 months, to cover rent, rates, etc., to the mother of a Sec. Lieut. in the Royal Flying Corps who had been killed on active service.

(202) An allowance of £2 a month for six months to the widow of a Private in the Royal Air Force who had died on active service.

(203) An allowance of £2 a month for six months to the mother of a 1st Class Air Mechanic in the Royal Air Force who had been killed on active service.

(205) An allowance of £2 a month for six months to the widow of a Private in the Royal Air Force who had died on active service.

(206) An allowance of £2 a month for six months to the mother of a Private in the Royal Air Force who had died on active service.

(207) An allowance of £3 a month for six months to the widow of a 1st Class Air Mechanic in the Royal Air Force who had died on active service.

(208) An allowance of £4 a month for three months to the mother of a Cadet in the Royal Air Force who had died on active service.

(209) An allowance of £2 a month for six months to the mother of a 2nd Class Air Mechanic in the Royal Air Force who had died on active service.

(210) An allowance of £2 a month for six months to the widow of a Private in the Royal Air Force who had died on active service.

The Flying Services Fund.

(Registered under the War Charities Act, 1916).

Administered by the Royal Aero Club

For the benefit of Officers, Non-Commissioned Officers and Men of the Royal Air Force who are incapacitated while on duty, and for the widows and dependants of those who are killed or die from injuries or illness contracted while on duty.

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The Right Hon. Lord Kinnaird.

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Mr. Chester Fox.
Lieut.-Col. T. O'B. Hubbard, M.C., R.A.F.
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Subscriptions.	£	s.	d.
Total subscriptions received to May 6th, 1919.....	15,001	9	10
Proceeds of Church collections at the Headquarters, North-Western Area, Royal Air Force, Glasgow	3	13	6
Headquarters, South-Western Area, Royal Air Force, Salisbury (tenth donation, making a total of £1,186 3s. 6d.)	50	0	0
Collected by H. Leslie Rollett	4	6	1
Collections made at Church Parade at No. 143 Squadron, Royal Air Force, Detling (second contribution)	1	0	0
Max Worms	2	2	0
Total, June 3rd, 1919	£15,062	11	5

THE POSSIBILITIES OF AVIATION IN PERU.

The paper read before the Royal Aeronautical Society on Wednesday, May 28th, by Mr. G. M. Dyott, late Squadron Commander, R.N.A.S., on the possibilities of the commercial use of aircraft in Peru proved to be of extreme interest.

Mr. Dyott departed very considerably from the printed paper, mainly because the extraordinarily interesting lantern-slides and cinema films shown called for a detailed description of the country. The spoken word and the illustrations must therefore be regarded as a complement to the written lecture which gives Mr. Dyott's opinions as to some of the possibilities of aviation in this little known part of the earth.

Those who heard the lecture must have received a very vivid idea of a country with an extraordinary mixture of very serious obstacles to the use of aerial vehicles, and entirely unexpected natural facilities for landing grounds.

Those who read the paper as printed will gain a very high idea of certain possible ways of overcoming the apparent obstacles and turning the natural facilities to profitable use.

It must be regretted that so excellent a series of pictures and so interesting a discourse should have been handicapped by the extraordinarily bad projection arrangements, and the defective acoustic properties which characterise the Theatre of the Royal Society of Arts.

Mr. Dyott's verbal description of the country in question cannot be reproduced to any effect without the use of the cinema pictures which illustrate it, and one must, therefore, content oneself with an abstract of the printed paper:

The Paper

To anyone who has made a careful study of aeronautics and its possibilities in the commercial world it is evident that South America offers unusual opportunities for development by aircraft, and of all South American countries Peru, on account of its climate, its rich natural resources, its geographical position, and its peculiar topographical configuration, is almost ideal. To fully appreciate the significance of this remark it is necessary to have a very clear conception of all those factors which go to make aerial transport a commercial possibility.

The topography of the country is of peculiar interest because it is more marked and more intense than that of any other part of the great American continent. Sandy desert vibrating with heat; mountain peaks glistening with perpetual snow; deep rocky gorges and vast tropical forests are all within a few days' ride of each other. In the interior we find that distances are relatively short, but the difficulties encountered in traversing them are colossal. Range after range bars the traveller's progress as he journeys eastward from the coast, and when after weeks of incessant travelling he finally emerges on the flat ground of the Amazon and its tributaries his passage is blocked by miles of impenetrable forest through which it is impossible to proceed farther.

Forced to travel by river, periodic whirlpools and rapids make progress slow and dangerous. Even when these are left behind, submerged logs are a continual menace to navigation; besides, the river, as it winds and wriggles over the low-lying ground, covers two or three times the actual distance represented by a straight line drawn from point to point.



A possible alighting place in the Andes. The lake in the foreground is three-quarters of a mile across and at an altitude of several thousands of feet.

This, then, is the dominant reason for regarding Peru as so amenable to aeronautical exploitation, especially when on top of all it is remembered that many of these inaccessible districts are rich in mineral and other natural resources which make it worth while bringing them within reach of the outside world.

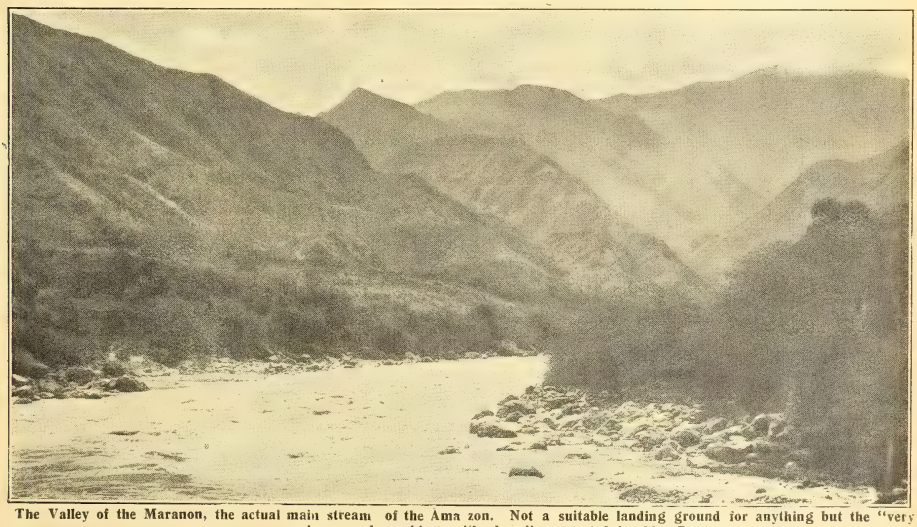
On the coast there is an infinite number of natural landing grounds available, and even amongst the high peaks of the Andes there are frequent table lands of considerable size which could be drained and levelled at no great cost.

In the region of woods the rivers afford mile after mile of waterways upon which hydro-aeroplanes could alight.

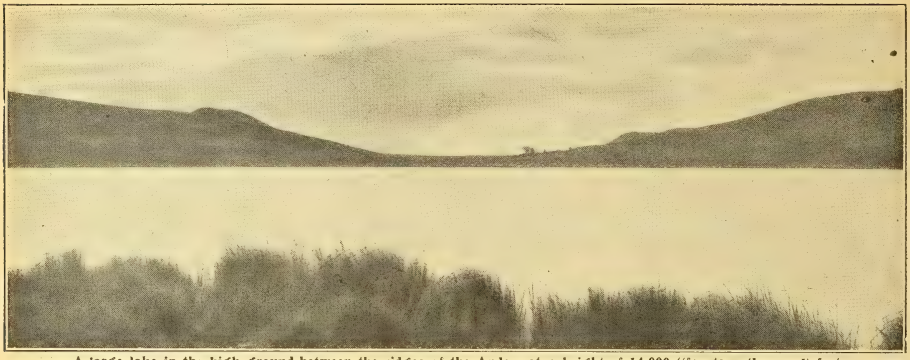
The mountain ranges would probably be the worst obstacles to overcome, but the highest of these need not be tackled at the outset, and much valuable work could be immediately accomplished on the coast. At a later period routes could be established over the lower passes of the Andes, such as Huarmaca, and then in the light of additional experience the highest ranges could be surmounted with ease.

In the general scramble of recent years to produce war machines of startling performance the question of cost has been almost entirely lost sight of. The fact that an aeroplane could accomplish things which no other known mechanism could do was sufficient to justify its existence. In the business world an entirely different state of affairs exists and cost is the final verdict upon which the art must sink or swim.

A comparison of costs between canal barge, railway, motor lorry, and aeroplane shows that the cost per ton-mile varies



The Valley of the Maranon, the actual main stream of the Amazon. Not a suitable landing ground for anything but the "very slow speed machines with claws" suggested by Mr. Dyott.



A large lake in the high ground between the ridges of the Andes, at a height of 14,000 ((fourteen thousand) feet.

from a small fraction of a penny in the first case to as much as eighteen or nineteen shillings in the last.

In the face of this very alarming figure it is by no means easy to define just what position is occupied by aircraft in the world of transportation.

If I were called upon to do so I would say that it is not a load-carrier, but essentially an expensive piece of machinery for saving time. Now throughout all Latin American countries, with the exception of a few large cities, time is of little or no value. Therefore there is no need of introducing costly machinery to save it.

There can be no doubt but what the opportunities for saving time are extraordinarily great, but this feature can only be appreciated by those who have travelled through the interior.

A typical example may serve to illustrate the point. Bauga-Chica, a small but important town on the Utcumamba river, is barely 140 miles from the Pacific coast. Yet to travel there by present means of locomotion takes two whole weeks of hard riding on mule back. A moderately fast aeroplane could accomplish the journey under two hours.

Briefly, we find Peru and its adjacent Republics highly susceptible to development by aircraft, but the most important element of all which would justify such costly means of locomotion is almost entirely lacking. Fortunately, Peruvians on the coast are already beginning to fall in line with modern ideas, and Europeans, to whom time is a very valuable asset, are acquiring large business interests all over the country, and their wants will have to be considered.

It would be a fatal error to count on the support of local inhabitants in any shape or form. Of course there are a few exceptions, but the very people to be benefitted might be openly hostile. Quite recently the Columbian Government was approached by an American firm with a view to establishing aerial service between Bogota and the coast. After some discussion the authorities replied that should the venture prove a failure it probably meant fatal accidents in which Columbians would be killed. If, on the other hand, it was successful, then a lot of foreigners would be brought to the capital, both of which alternatives were undesirable. This is typical of the attitude of the inhabitants of many sections of South America.

An aeroplane cannot possibly compete in the transportation of freight and merchandise with other means of locomotion under normal conditions. When abnormal conditions obtain, an aerodrome can often come to the rescue and show a profit.

The following typical examples of abnormal conditions in Peru are well worth serious consideration in view of the fact that others of a similar nature can be found.

On the east side of the Maranon river, near Soledad, in the department of La Libertad, are some gold-mines being developed by a Russian, Sr. Tarnivisky. About 60 tons of material and machinery have been brought up from Salaverry on the coast 90 miles away at a cost averaging £100 a ton. It has taken three full years to do this, and another six months will have passed before the mine and mill are in operation.

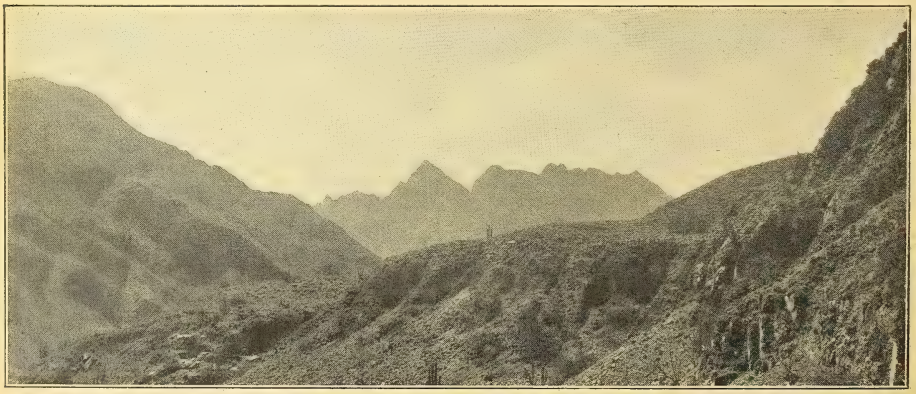
A suitable aeroplane would have moved the same freight with the greatest ease within six months and shown a profit at the same rate of £100 per ton. The profit would not have been all on the side of the transportation company either, as the owners of the mine would have started production three years earlier and thus saved interest on capital for three barren years, to say nothing of profits that might have been made during that time had the mine been working.

The machinery was all built in special small sections suitable for mule transport. This increased its first cost and delayed delivery. An aeroplane could have transported every piece in its normal section.

Sr. Sota, the manager of the mine, figured out that the company could have afforded to pay £140 a ton to get the machinery on the ground within a year.

It so happened that but a short distance above the mine was a large pampa and of such proportions as to make an excellent landing ground at very little cost. Not only would the mine have benefitted, but the villages of Soledad, Parcoy, and others which now lead a life of complete isolation, although only 90 miles from the coast.

(To be continued.)



A typical scene in the "Puna lands" of the Andes.



FROM THE "LONDON GAZETTE."

ADMIRALTY, May 30th.

Lt. to be Lt.-Comdr. :—F. G. Brodribb, May 30th

AIR MINISTRY, June 3rd.

R.A.F.—The following temp. appointments are made at the Air Ministry :—Staff Officers, 1st Cl.—Lt.-Col. T. E. St. C. Daniell, O.B.E., M.C. (T.), Maj. G. Laing, O.B.E. (T.), Maj. J. H. Hills, O.B.E. (D.), Maj. A. L. C. Neame (Q.), Capt. H. Cumming, O.B.E. (T.), Capt L. P. Ball, O.B.E. (Q.), Capt. R. W. Thomas (Q.), May 1st.

Staff Officers, 2nd Cl.—Maj. P. C. A. Bridgeman (T.), Maj. O. H. Powell (T.), Capt. D. W. Wilson (T.), Capt. R. G Lord St. Oswald (Q.), Capt. W. H. G. Maton, M.B.E. (Q.), Capt. C. Mason (Q.), Lt. G. W. Longstaff (T.), Sec. Lt. F. A. Holmes (Q.), May 1st; Capt. L. Auker, O.B.E. (Q.), May 14th.

Staff Officers, 3rd Cl.—Capt. C. Rayner (T.), Capt. T. G. Skeats (T.), Capt. W. Burkinshaw (T.), Capt. H. L. Crichton (T.), Capt. N. K. Fuller (T.), Capt. F. D. Newbury (T.), Lt. (Hon. Capt.) H. W. Clarke (Q.), Lt. H. F. Walker (T.), Lt. F. E. Hobley (T.), Lt. C. H. Masters (T.), Lt. H. P. Bridges (Q.), Lt. H. J. Birtles (Q.), Sec. Lt. (Hon. Capt.) D. R. Thomas (Q.), Sec. Lt. (Hon. Lt.) W. E. Harper, M.C. (T.), Sec. Lt. (Hon. Lt.) T. H. Evans (T.), Sec. Lt. A. E. Murray (Q.), Sec. Lt. E. L. Ridley (Q.), Sec. Lt. A. T. Cooper (Q.), Sec. Lt. W. J Bray (Q.), Sec Lt. T. H. Sills (Q.), Sec Lt. A. J. Somers (Q.), Sec Lt. B. F Browne (Q.), May 1st.

Staff Officers, 4th Cl.—Lt. A. H. Comfort (T.), Lt. L. T. Sanderson (T.), Lt. J. T. Vernon (T.), Sec. Lt. C. H. Boreham (T.), Sec. Lt. C. V. Mitchell (T.), Sec. Lt. J. Hobbs (T.), Sec. Lt. D. W. Dean (T.), May 1st.

The following temp. appointments are made :—Staff Officers, 2nd Cl. (P.).—Maj. W. G. W. Prall, May 27th

Staff Officer, 3rd Cl. (P.).—Lt. F. V. Goode, April 9th, and to be actg. Capt. until April 30th.

FLYING BRANCH.—Lt.-Col. C. R. Finch-Noyes to be Lt.-Col (A. and S.), from (S.O.), March 5th (substituted for notification in "Gazette," May 9th).

R. Williams, D.S.O. (Lt.-Col., Australian Flying Corps), is granted a temp. supplemental Commn. as Lt.-Col. (A.), June 28th, 1918 (substituted for notification in "Gazette," April 8th).

Capt. F. W. Hudson to be actg. Maj. while empld as Maj. (A.), from Dec. 30th, 1908, to April 30th.

Capt. O. R. Griffin to be graded for pay and allowances while empld as Capt. (A.), from Aug. 1st, 1918, to April 30th

Lt. G. E. Tugwell to be actg. Capt. while empld. as Capt (A. and S.), from Aug. 1st, 1918, to April 30th

Lt. H. D. Lewis to be actg. Capt. while empld. as Capt (K.B.), from May 31st, 1918, to April 30th.

Lt. T. J. Gillow to be Lt. (A.), from (Ad.), Jan 20th

Sec. Lt. V. Ross to be Lt., Sept. 6th, 1918.

Sec. Lt. H. W. F. Pennick (late Gen. List, R.F.C., on prob.) is confirmed in rank as Sec. Lt. (A.), Dec. 30th, 1918.

Sec. Lt. S. C. Paice (late Gen. List, R.F.C., on prob.) is confirmed in rank as Sec. Lt. (A.), May 1st (since killed).

29702 Flt. Comdt. F. R. Atkinson is granted a temp. commn. as Sec. Lt. (A.), Oct. 18th, 1918.

The following relinquish their commns. on ceasing to be empld. :—Sec. Lt. (Hon. Lt.) W. J. Kolosoff, M.M (Lt., B. Col. R.), Feb. 3rd; Lt. L. Holman (Lt., Hussars), Feb. 11th; Lt. G. G. Edgell (Lt., Gen. List), Feb. 16th; Sec. Lt. (Hon. Lt.) W. J. Jackson (Lt., Rif. Bde.), Feb. 24th; Capt. (actg. Maj.) P. A. Landry (Capt., B. Col. R.), Feb. 28th; Lt. F. C. Aulagnier (Lt., Essex R.), March 11th; Lt. H. Lay (Lt., B. Col. R.), March 17th; Lt (actg. Capt.) C. H. J. James (Capt., Can. M.G.C.), March 21st; Lt. H. L. Kennedy (Lt., E. Ont. R.), March 31st; Lt. (Hon. Capt.) E. M. Ashton (Capt., Suff. R.), April 1st; Lt. S. A. Villier (Lt., R.F.A.), April 3rd; Sec. Lt. (Hon. Lt.) L. A. W. Knight (Lt., Worc. R.), April 11th; Sec. Lt. (Hon. Capt.) C. D. Moorhead (Lt., Manchester R.), April 14th; Lt. (actg. Capt.) G. F. Armstrong (Capt., E. Ont. R.), April 24th; Lt. (actg. Maj.) L. Scott, D.C.M. (Capt (actg. Maj.), E. Ont. R.), May 8th; Lt. (actg. Capt.) C. B. Cowley (Capt., E. Ont. R.), May 15th; Lt. B. Cockshott (Lt., B. Col. R.), May 16th; Sec. Lt. (Hon Lt.) A. R. Cowan, May 19th (Hon. Capt.) Sir R. T. Leighton (Capt., West. and Cumbld. Yeo.), May 27th.

Transferred to the unempld. list :—Lt. R. S. Gregory, Jan. 28th; Lt. L. J. Frost, Jan. 29th; Sec. Lt. (Hon. Lt.) C. F. Laxton, Feb. 3rd; Sec. Lt. R. Bond, Feb. 7th; Lt. G. Bullen, Feb. 11th; Lt. A. H. Burton, Feb. 11th (substituted for notification in "Gazette," Feb. 28th); Lt. H. G. A. Pearson, Feb. 16th; Lt. G. Graham-Green, Feb 21st; Sec Lt. D. McG. Spencer, Feb. 27th; Sec. Lt. W. K Van-Ness, Feb 28th; Lt. R. Biggar, Sec. Lt. R. M. Rodgers, March 1st; Sec Lt. J. F Dodd, March 4th; Lt. J. C. Anderson, March 6th; Sec. Lt. W. C. Allardyce, March 7th; Sec. Lt. (Hon. Lt.) J. Scott, March 14th; Sec. Lt. M. R. Davis, March 15th; Lt. W. Seagram (R.F.A.), March 18th; Lt. A. T. Smith, March 26th; Lt. F. Shepherd, March 27th; Lt. W. E. Watt, March 31st; Sec. Lt. W. J. H Hawkins, Lt. J. A. Hesselden, Lt. B. V. Richardson, Sec. Lt. G. N. Russell, Sec. Lt. C. J. Robinson, Sec. Lt. J. G. Spence, Sec. Lt. C. G. Tallmadge, Sec. Lt. J. Watson, April 1st; Lt. A. L. Greer, Capt. P. G. Williams, April 4th; Lt (actg. Capt.) J. Gregory (R.F.A., T.F.), Sec. Lt. O. H. White, April 5th; Sec Lt. S. Lovett, Lt. (actg. Capt.) G. W. Shuter, April 7th; Lt. H. J. Young, April 9th; Capt. D. P. FitzGibbon, D.S.C., Sec. Lt. W. A. Wilson, April 10th; Sec. Lt. F. Henriques, Lt. H. J. Sier, Capt. T. P. Whitcomb, April 11th; Sec. Lt. G. Godfrey, April 12th; Lt. R. E. C. Spencer (Wilts. R.), Sec. Lt. C. M. Willy, April 14th; Sec. Lt. T. W. Griffiths, Sec. Lt. H. H. Gardner, April 15th; Capt. (actg. Maj.) E. Cadbury, D.S.C., D.F.C., Lt. E. J. Fuich (London R., T.F.), Lt. V. Henry, Sec Lt. A. C. Heyes, Lt. W. A. McKay, Sec. Lt. E. P. Nickless, Lt. R. Waugh, Lt. W. M. Wessel, Sec. Lt. L. Wilson, April 15th; Sec. Lt. F. G New, Sec. Lt. E. H. Smy, Sec. Lt. D. West, Lt. P. W. Smith, April 16th, Capt. V. D. Drury, Lt. F. J. O'Shea, April 17th; Sec. Lt. N. Wallace, Sec. Lt. L. Wveth, Sec. Lt. H. R. Wolton, Sec. Lt. R. D. Wayman, April 18th; Sec. Lt. T. F. Birbeck, Sec. Lt. P. H. Carson, Sec. Lt. H. G. Darroch, Sec. Lt. W. H. Doherty, Sec. Lt. P. J. Groome, Sec. Lt. R. G. Lockwood, Sec. Lt. W. T. Martin, Lt. W. H. O'Neil, Sec. Lt. E. L. Peters, Sec. Lt. J. Priestman, Lt. G. L. Vezine, April 10th; Capt. C. F. Denning, M.C. (R. West Surr R.), Sec. Lt. N. J. Spencer, Lt. C. F Warren, April 21st; Lt. (actg. Capt. P. W. Sourr (R. Berks. R.), Lt. S. G. Williams, Lt. H. J. Youngman, April 22nd; Sec. Lt. R. E. La F. Wyatt, April 24th; Maj. A. Somervail, M.C., A.F.C., Lt. C. H. Williams, April 26th; Sec. Lt. F. G. Lake, Lt (Hon. Capt.) E. T. Lavarack, Capt. H. Shaw, April 27th; Lt. E. S. Williams, Sec. Lt. J. Wooding, April 28th, Capt. S. G. Gilmour, Sec. Lt. C. W. Gill, Lt. E. D. Salthouse, Capt. R. N. Wolton, April 29th; Capt. T. P. M. Alexander, Lt. G. F. Dell (Yorks. R., T.F.), Lt. S. S. Henry, Lt. J. Henry, Sec. Lt. G. A. King, Sec Lt (Hon. Lt.) J. C. F. Wilkinson, M.C., April 30th; Sec Lt. N. E Smith, May 1st; Sec. Lt. G. H. Collins, Sec. Lt. O. H. P. Lloyd, Capt. J. A. Shaw, Sec. Lt. E. F. Shaw, Sec. Lt. A S Sinclair, May 2nd; Lt. K. Norwood, Capt. W. H. N. Shakespeare, M.C., A.F.C., May 4th; Capt. M. B. Frew, D.S.O., M.C., May 5th; Sec. Lt. C. M. Tupling, May 6th; Maj. K. S. Savory, D.S.O., May 7th; Sec Lt. D. W. Harris, Capt. R. M. Stirling, Lt. R. B. L. Taylor (S. Lan. R.), May 8th; Lt. L. N. T. Stuart-Campbell, Sec. Lt. J. Tibbatts, Lt. T. C. Stewart, May 9th; Sec. Lt. (Hon Lt.) F. E. J. Shiner, M.C., Capt. T. G. C. Wood, May 10th; Sec. Lt. R. C. Cornell, Sec. Lt. A. S. Cowlishaw, Capt. C. F. Davies (R. Highrs., T.F.), May 11th; Lt. R. J. Aitken, Sec. Lt. H. D. Anderson, Sec. Lt. H. O. K. Ayling, Lt. T. B. Tully, A.F.C., May 12th; Lt. (Hon. Capt.) P. A. Broder, Sec. Lt. R. C. Coulson, Sec. Lt. P. J. Cross, Lt. G. Dixon, Sec. Lt. W. D. Evans, Sec. Lt. G. R. St. C. Gwynne-Timothy, Lt. F. H Thompson, May 13th; Lt. G. A. Anderson, Lt. A. J. Fisher, Maj. E. E. M. L. Gower, Lt. F. C. Leonard, Lt. A. C. McArthur, Sec. Lt. G. S. Scott, May 14th; Sec. Lt. (Hon. Lt.) O. P. Allcock, Sec. Lt. S. N. Bown, Lt. J. Carrey, Maj. C. Draper, D.S.O., Lt. C. J. Heywood, Lt. E. J. Mackay, Lt. (Hon. Capt.) C. de P. D. Swains, May 15th; Sec. Lt. F. Clarke, Sec. Lt. T. Fairley, Lt. A. L. Seddon, Sec. Lt. W. Shackleton, Lt. K. W. Switzer, Sec. Lt. G. Scott, May 16th; Sec. Lt. A. Adam, Lt. W. Adams, Sec. Lt. W. Alexander, Lt. D. Alliban, D.F.C., Lt. J. G. Blane, Sec. Lt. C. A. Bonar, Lt. W. B. C. Buchanan, Lt. H. A. Brosse, Sec. Lt. E. Charge, Sec. Lt. W. R. N. Cheetham, Sec. Lt. J. W. Fidlin, Lt. W. G. Gwatkin, Sec. Lt. C. C. Salmon, May 17th; Sec. Lt. T. Bailey, Sec. Lt. L. Dawson, May 18th; Sec. Lt. E. H. Alliott, Capt. C. Cooper (Capt., R. W. Surr. R.), Capt. C. R. Edwards, D.S.C., Capt. C. A. Maitland-Heriot, Sec. Lt. C. E. Parker, Sec. Lt. F. M. Tobin, May 19th; Sec. Lt. H. Allward, Sec. Lt. E. O. Bell, Lt. A. C. Bencher (London R., T.F.), Sec. Lt. B. Champion, Sec. Lt. E. R. Cossar, Lt. A. W. Cullington, Sec. Lt. W. D. E. Donaldson, Sec. Lt. S. I. Dunlop, D.F.C., Sec. Lt. E. L. French, Sec. Lt. G. B. Gardiner, Lt. J. C. Gilchrist, Sec. Lt. R. H. Goodwin, Lt. L. M. McNab, May 20th; Lt. C. P. Adamson, Sec. Lt. S. D. Bicknore, Lt.-Col. R. G. Blomfield, D.S.O., Lt. E. V. Culverwell, Sec. Lt. M. Dawson, Sec. Lt. C. T. Marshall, Lt. F. E. Short, May 21st; Lt. N. D Armstrong, Lt. M. E. Barlow, Sec. Lt. R. P. D'Alton, Sec. Lt. J. W. Morris, Lt. D. W. Paton, Lt. C. Packham, Lt. S. H. C. Waller (Suffolk R., T.F.), May 22nd; Sec. Lt. M. F. S. Burger, Capt. R. A. Birkbeck, D.F.C., Lt. G. F. Bayne, Sec. Lt. H. D. Buchanan, Sec. Lt. F. A. R. Burris, Sec. Lt. J. M. Calnek, Lt. A. H. Craig, Lt. K. H. Crane, Sec. Lt. K. W. Cumming, Lt. L. Daly, Sec. Lt. T. H. Delaney, Sec. Lt. F. M. Dunlop, Sec. Lt. A. Gertrey, Sec. Lt. G. M. Gossage, Sec. Lt. C. S. Griffiths, Sec. Lt. J. A. Muir, Lt. H. S. Maxwell, Lt. R. S. Martin, May 23rd; Sec. Lt. A. Greig, Capt. O. R. Griffin, May 24th; Sec. Lt. A. MacKinnon, May 26th; Capt. R. D. Simpson, D.F.C., May 27th; Lt. A. G. Cooper, May 28th; Lt. H. W. Campbell, May 29th; Lt. N. L. Knight, May 31st; Sec. Lt. G. W. Armstrong, June 2nd.

The following Lts. relinquish their commns. on account of ill-health and are permitted to retain their rank :—H. G. Nicholson, April 24th (substituted for notification in "Gazette," Jan 15th); A. Crozier (contracted on active service), May 20th; W. R. McCoo (caused by wounds), May 22nd.

The following Lts. relinquish their commns. on account of ill-health : —G. L. Barrett (caused by wounds), March 12th (substituted for notification in "Gazette," March 11th); T. Nicholson (D.L.I.) (caused by wounds), June 1st.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—A. K Barter, D.F.C. (contracted on active service); H. Lawrence (caused by wounds), May 22nd.

Lt. J. E. Ferrand to take rank and precedence as if appointment as Lt. bore date July 1st, 1918.

Lt. R. Kilpatrick to take rank and precedence as if his appointment as Lt. bore date July 1st, 1918.

The initials of Lt. C. W. Turner are as now described, and not as stated in "Gazette," Oct 22nd, 1918

The notification in "Gazette," Nov. 8th, 1918, concerning Sec. Lt. G. J. Gawthorne (K.B.) is cancelled.

The notifications in "Gazette," April 4th, concerning the undermentioned officers are cancelled :—Sec. Lt. G. A. King, Sec. Lt. G. A. King, Lt. S. R. Coward.

The notification in "Gazette," April 16th, concerning Lt. W. H. Gibson is cancelled.

The notification in "Gazette," April 29th, concerning Lt. M. A. Fisher-Brown is cancelled.

The notification in "Gazette," April 20th, concerning Lt. G. B. Dixon is cancelled.

The notification in "Gazette," May 9th, concerning Sec. Lt. C. L. Tench is cancelled (notification of May 23rd to stand).

The notification in "Gazette," May 20th, concerning Sec. Lt. J. I. Duval is cancelled.

ADMINISTRATIVE BRANCH.—Capt. H. N. Walker, M.C., to be Capt., from (S.O.), May 1st.

Lt. H. R. Escott-Martin, M.C., to be actg. Capt. whilst empld. as Capt. (from Jan. 27th to April 30th).

Lts. to be Lts., from (A.) :—D. W. Paton, April 17th (substituted for notification in "Gazette," April 29th); A. L. Hitt, May 17th.

Sec. Lt. C. T. H. Page to be Lt., April 30th

Sec. Lt. (Hon. Lt.) J. D. C. Curtis, M.C., to be actg. Lt. whist empld. as Lt. (from April 1st, 1918, to April 30th)

Sec. Lts. to be Sec Lts., from (A.) :—M. A. Jordan, D. H Edmiston, May 15th; A. C. Porter, S. T. Crowe, May 20th.

Sec. Lt. A. D. Miller (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lt., Nov. 21st, 1918.

H. Priestman (Maj., New Brunswick R.) is granted a temp. commn. as Sec. Lt., May 31st, 1918, and to be Hon Maj.

A. Ashby is granted a temp. commn. as Sec. Lt., May 19th.

The following relinquish their commns. on ceasing to be empld. :—Capt. F. R. Jones (Cant., Lond. R.), Feb 16th; Lt. F. P. Duff, March 10th; Lt. (actg. Capt.) H. C. Griffith (Lt., S. Wales Bord.), April 8th;

Lt. (actg. Capt.) R. B. L. Persse (Lt., Shropshire L.I.), April 16th; Sec. Lt. R. K. Orchard (Sec. Lt., R. Welsh Fus.), April 20th; Sec. Lt. (actg. Lt.) J. McCarthy (Sec. Lt., Cheshire R.), April 2nd; Sec. Lt. (Hon. Capt.) J. Graham (Capt. and Qrmr., Scot. Rifs.), May 12th; Lt. J. W. J. Cheyney (commd. supwright, R.N.), May 19th. Lt.-Col. R. G. Talbot, C.B.E. (Lt.-Commdr., R.N.), May 21st.

Transferred to the unemplo. list:—Capt. R. G. Norman, Jan. 15th; Lt. J. W. Murray, March 1st; Capt. R. J. Whiteley, March 22nd; Lt. D. S. Gray, Lt. C. A. R. Judd, April 12th; Sec. Lt. J. C. Garratt, April 14th; Sec. Lt. (actg. Lt.) G. N. J. Shaw, Lt. E. E. N. Smith, Sec. Lt. C. Wiseley, April 19th; Lt. (actg. Capt.) G. F. Golding, April 20th, Sec. Lt. A. W. A. Wyett, April 24th; Sec. Lt. W. C. Faulkner, April 27th; Sec. Lt. J. F. Groom, April 28th; Lt. C. R. Joung, April 30th; Capt. J. D. H. Osborn, May 1st; Sec. Lt. W. Sangster, May 2nd, Sec. Lt. (Hon. Capt.) L. H. Tosswill (Worc. R.), May 9th; Sec. Lt. F. D. Owen, Sec. Lt. G. P. W. Haines, May 12th; Sec. Lt. C. N. Cruttwell, Sec. Lt. W. R. Glossop, Lt. F. V. Tattersall, May 14th; Maj. F. E. Cooper, May 15th; Capt. R. H. Gee (K.R.R.C.), Sec. Lt. E. Slinger, May 16th; Sec. Lt. C. M. Collett, Sec. Lt. E. G. Delgrave, May 20th; Lt. W. Swire, May 21st; Maj. E. A. Ewart, O.B.E., Sec. Lt. (Hon. Lt.) H. W. Middleton, May 22nd; Lt. C. McK. McGavin, May 24th; Lt. N. Smith, May 30th; Lt. H. C. R. Milward, May 31st; Sec. Lt. R. W. Turner, D.F.C. (Yorks. R.), June 1st; Sec. Lt. A. J. Gaiton, June 2nd.

The following Capts. relinquish their commns. on account of ill-health:—G. Goodwin (Suffolk R.), G. R. Page (Capt., Lond. Yeo.) (caused by wounds), May 16th.

The following Lts. relinquish their commns. on account of ill-health:—W. J. Wyatt (Devon R.), contracted on active service, May 20th; G. Gilling (and retains his rank).

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—J. T. Ellott, May 20th; Lt. E. Walmsley, May 22nd.

The notification in "Gazette," Feb. 14th, concerning Sec. Lt. W. Twamley is cancelled.

The notification in "Gazette," March 28th, concerning Sec. Lt. C. Campbell is cancelled.

Technical Branch.—Capt. E. I. David to be actg. Maj. whilst empld as Maj., Grade (A), June 6th, 1918 (substituted for notification in "Gazette," Nov. 15th, 1918).

Capt. D. C. Waylen to be Capt., Grade (A), from (S.O.), April 23rd.

Lt. W. L. Shaw to be actg. Capt. whilst empld. as Capt., Grade (A), from March 11th to April 30th.

Lt. G. Thomas to be graded for purposes of pay and allowances as Capt., while empld. as Capt., Grade (A), May 1st.

V. P. Turner (Lt., Aus. Flying Corps) is granted a temp. supplementary commn. as Lt., Grade (A), July 24th, 1918 (substituted for notification in "Gazette," April 8th).

Lt. H. C. Bobbett to be Lt., Grade (B), from (S.O.), May 1st.

Sec. Lt. W. Limiker to be actg. Lt., whilst empld. as Lt., Grade (B), April 1st, 1918, to April 30th.

Sec. Lt. L. S. Bullock to be Sec. Lt., Grade (A), from (A), and to be actg. Lt. while empld. from Jan. 13th to April 30th).

Sec. Lt. J. W. Smith to be Sec. Lt., Grade (A), from (Ad.), Feb. 18th.

Sec. Lt. E. A. Blundell to be Sec. Lt., Grade (A), from (A'ships), June 29th, 1918.

Sec. Lt. L. F. E. Smith to be Sec. Lt., Grade (A), from (K.B.), May 1st.

Sec. Lt. C. E. Tidy to be Sec. Lt., Grade (B), from (A), April 29th.

The following relinquish their commns. on ceasing to be empld.:—Lt. (Hon. Capt.) the Hon. E. H. J. Boscawen (Capt., Coldstream Gds.), June 29th, 1918; Lt. P. Irwin-Packington (Lt., R.G.A.), March 14th; Sec. Lt. (Hon. Lt.) W. E. Hughes (Lt., Leic. R.), June 3rd.

Transferred to unempld. list:—Capt. P. J. James, March 11th; Capt. (actg Maj.) F. A. Bumpus, March 21st (substituted for notification in "Gazette," April 1st); Capt. W. G. Watson, April 2nd; Sec. Lt. (Hon. Lt.) J. R. Gibson (Lond. R., T.F.), April 4th; Sec. Lt. R. S. Lewis, April 4th; Sec. Lt. C. A. White, April 11th; Sec. Lt. L. Henri, April 12th; Lt. (actg. Capt.) R. Gregory, April 13th; Sec. Lt. H. D. Harrison, Sec. Lt. (actg. Lt.) R. W. Hogg, April 19th; Sec. Lt. (Hon. Capt.) E. R. Loder, April 24th; Sec. Lt. (Hon. Lt.) C. E. Wilkin, April 29th; Sec. Lt. P. R. Williams, April 30th; Capt. J. F. G. Fitzgerald, May 2nd; Sec. Lt. E. Sidey, May 4th; Capt. A. Fry, May 6th; Sec. Lt. (Hon. Lt.) R. C. Graham, Capt. J. W. B. Simeon, May 7th; Capt. E. D. Dent (Durh. L.I.), May 9th; Sec. Lt. B. V. Seaward, May 10th; Lt. A. H. Cray, May 11th; Capt. F. Christie, M.B.E., May 13th; Maj. F. G. Atkinson, Capt. B. F. Crane, Lt. J. Farquharson, May 15th; Capt. J. J. Botterill, Lt. H. W. K. Jellings, Sec. Lt. R. A. Winfield, May 18th; Lt. G. Adams, Sec. Lt. (Hon. Capt.) J. E. Appleyard, Lt. E. Bamett, May 17th; Capt. J. H. Ball, May 20th; Sec. Lt. N. G. Arnold, Sec. Lt. (Hon. Lt.) G. Pellew, May 21st; Sec. Lt. W. W. Ball, May 24th; Sec. Lt. A. J. Evans, May 30th.

Sec. Lt. C. W. Mayne relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Lt., May 27th.

The notification in "Gazette," March 28th, concerning Capt. P. J. Jones, is cancelled.

The notification in "Gazette," April 29th, concerning Sec. Lt. (Hon. Lt.) R. W. V. Midland, is cancelled.

Dental Branch.—Lt. R. S. H. Drabble is transferred to unempld. list, April 17th.

Chaplains Branch.—The Rev. J. A. Chesterton is transferred to unempld. list, May 20th.

Memoranda.—Maj. J. D. K. Restler to be actg. Lt.-Col. while empld. as Chief Electrical Engineer in the Dept. of A.W.B., May 1st (substituted for notification in "Gazette," May 27th).

E. G. Knox (Capt., Australian Flying Corps) is granted a temp. supplementary commn. as Capt., and to be actg. Maj. from Oct. 11th, 1918, to April 30th (substituted for notification in "Gazette," April 8th).

The following relinquish their commns. on ceasing to be empld.:—Maj. E. P. A. Melville, O.B.E., from (S.O.), April 1st, and is granted the rank of Lt.-Col.; Temp. Hon. Lt. W. J. Duncan, April 16th; Capt. O. W. Latimer, May 3rd.

Transferred to unempld. list:—Lt. (Hon. Capt.) (actg. Maj.) W. Reid (King's Lpool R., T.F.), from (S.O.), April 15th; Sec. Lt. (actg. Maj.) W. G. Webber, from (S.O.), April 22nd; Capt. P. C. Carr, from (S.O.), May 6th; Lt. (Hon. Capt. G. W. Frost, from (S.O.), May 20th.

Col. (Bt. Col. in Army) F. L. Festing, C.M.G., relinquishes his commn. on ceasing to be empld., and is granted the hon. rank of Brig.-Gen., May 31st (substituted for notification in "Gazette," May 20th).

The notification in "Gazette," April 15th, concerning Maj. (actg. Lt.-Col.) E. P. A. Melville, O.B.E., is cancelled.

St. James's Palace, June 3rd.

The King has been pleased, on the occasion of His Majesty's Birthday, to give orders for the following promotions in, and appointments to, the Most Excellent Order of the British Empire, for valuable services rendered in connection with the war:—

C.B.E. (Military Division).

Maj. (temp. Lt.-Col.) J. C. G. A. Hankey, O.B.E., M.V.O., R.A. (R. of O.).

M.B.E. (Military Division).

Lt. (temp. Capt.) G. K. Chambers, R.G.A. (Spec. Res.).
Temp. Capt. W. E. de B. Whittaker (Gen. List).

Air Ministry, June 3rd.

Order of the Bath.

The King has been pleased, on the occasion of His Majesty's birthday to give orders for the following appointments to the Most Honourable Order of the Bath, in recognition of distinguished services during the war:—

C.B.

Maj.-Gen. J. F. A. Higgins, D.S.O., A.F.C. (R. Arty.) (France); Col. (actg. Brig.-Gen.) H. R. M. Brooke-Popham, C.M.G., D.S.O., A.F.C. (Oxf. and Bucks. L.I.) (France); Col. actg. Maj.-Gen.) C. L. Lambe, C.M.G., D.S.O. (Flanders); Col. (actg. Maj.-Gen.) I. I. Webb-Bowen, C.M.G. (Bedford R.) (Granges); Col. (actg. Brig.-Gen.) F. L. Festing, C.M.G. (North'd. Fus.) (France).

Order of St. Michael and St George.

The King has been pleased, on the occasion of His Majesty's birthday, to give directions for the following appointments to the Most Distinguished Order of Saint Michael and Saint George in recognition of distinguished services rendered during the war:—

K.C.M.G.

Maj.-Gen. W. G. H. Salmond, C.B., D.S.O. (R.A.) (Egypt).

C.M.G.

Col. (actg. Brig.-Gen.) J. M. Steel, C.B.E.; Col. (actg. Brig.-Gen.) E. A. D. Masterman, C.B.E., A.F.C.; Col. (actg. Brig.-Gen.) H. P. Smyth-Osbourne (France); Col. F. C. Hanahan, D.S.O., M.V.O.; Col. (actg. Brig.-Gen.) P. R. C. Groves, D.S.O. (Shrop. L.I.); Lt.-Col. (actg.-Col.) R. C. S. Hunt; Lt.-Col. (actg. Col.) C. R. Samson, D.S.O., A.F.C.; Lt.-Col. (actg. Brig-Gen.) E. R. Ludlow-Hewitt, D.S.O., M.C. (R. Ir. Rifles) (France); Lt.-Col. (actg. Col.) U. J. D. Bourke (Oxf. and Bucks. L.I.); Lt.-Col. (actg. Brig.-Gen.) A. E. Porton, D.S.O., A.F.C. (R. Highrs.) (Egypt); Lt.-Col. (actg. Brig.-Gen.) A. Fletcher, C.B.E., M.C. (R.E.); Lt.-Col. A. D. Warrington-Morris, O.B.E.; Lt.-Col. actg. Brig.-Gen.) J. A. Houison-Craufurd, C.B.E. (Ind. Army); Maj. (actg. Lt.-Col.) J. A. Chamier, D.S.O., O.B.E. (Ind Army) (France); Lt.-Col. A. S. Barratt, M.C. (R.A.) (France), Lieutenant-Colonel C. Fraser, O.B.E., M.C. (N. Staff. R.) (Egypt); Maj. (actg. Lt.-Col.) R. A. Bradley (N. Staff. R.) (Mesopotamia)

Order of the British Empire.

The King has been pleased, on the occasion of his Majesty's birthday, to give orders for the following promotions in, and appointments to, the Most Excellent Order of the British Empire, in recognition of distinguished services rendered during the war:—

D.B.E. (Military Division).

Comdt. Mrs. H. C. I. Gwynne-Vaughan, C.B.E., Women's R.A.F.

C.B.E. (Military Division).

Lt.-Col. (actg. Brig.-Gen.) R. K. Bagnall-Wild, C.M.G. (R.E.); Lt.-Col. B. C. Bartley; Col. A. M. Bent, C.M.G. (R.M. Fus.); Lt.-Col. the Hon. J. D. Boyle, D.S.O. (Rif. Bde.); Lt.-Col. C. S. Burnett, D.S.O. (H.L.I.) (Egypt); Col. (actg. Brig.-Gen.) B. H. Cooke, C.M.G., D.S.O. (R. Bde.); Lt.-Col. (actg. Col.) E. H. Davidson, D.S.O. (Highrs.); Col. (actg. Brig.-Gen.) B. C. H. Drew, C.M.G. (Ind. A.); Lt.-Col. J. Dunville, O.B.E.; Maj.-Gen. E. L. Ellington, C.B., C.M.G. (R.A.); Lt.-Col. (actg. Brig.-Gen.) P. L. W. Herbert, C.M.G. (N. and D. Regt.) (Egypt); Lt.-Col. (actg. Brig.-Gen.) C. G. Hoare, C.M.G. (Ind. A.) (Canada); Lt.-Col. C. F. Jenkin, M.B.E., Lt.-Col. (actg. Brig.-Gen.) C. C. Marindin, D.S.O. (R.A.); Maj. (actg. Lt.-Col.) E. P. A. Melville, O.B.E. (Ind. Army); Lt.-Col. (actg. Brig.-Gen.) R. H. More, C.M.G. (Imp. Yeo.); Lt.-Col. (actg. Col.) R. H. Mulock, D.S.O. (I. Force) (France), Lt.-Col. (actg. Brig.-Gen.) C. L. N. Newall, C.M.G., A.M. (Ind. Army) (I. Force) (France); Maj. (actg. Lt.-Col.) E. Osmond (Flanders); Col. (actg. Brig.-Gen.) D. Le G. Pitcher, C.M.G., D.S.O. (Ind. Army) (France); Lt.-Col. R. E. M. Russell, D.S.O. (R.E.) (Egypt); Maj. (actg. Lt.-Col.) W. J. Ryan, O.B.E. (A.S.C.) (I. Force) (France); Lt.-Col. (actg. Col.) S. E. Smith, O.B.E. (Glouc. R.); Col. (actg. Brig.-Gen.) O. Swann, C.B. (Mediterranean); Lt.-Col. A. Sykes, O.B.E. (R. Ir. Fus.); Lt.-Col. (actg. Brig.-Gen.) J. G. Weir, C.M.G. (R.A., T.F.); Lt.-Col. H. V. Wells; Col. (actg. Brig.-Gen.) K. Wigram, C.B., D.S.O. (Ind. Army) (France).

O.B.E. (Military Division).

Capt. (actg. Maj.) P. Adams; Capt. (actg. Maj.) S. W. Addison (Aus. F.C.) (Palestine); Maj. V. A. Albrecht, M.C. (Manc. R.) (I. Force) (France); Maj. the Rev. J. Anderson (R. Defence Corps); Maj. J. Archer (R.F.A.S.R.) (Egypt); Capt. (Hon. Maj.) W. B. Armitage (Lanc. Fus.); Capt. (actg. Maj.) J. E. Arrol-Hunter; Capt. (Hon Maj.) W. R. G. Atkins (Egypt); Capt. (actg. Maj.) C. H. Awcock (R.G.A.) (Italy).

Lt.-Col. J. E. A. Baldwin, D.S.O. (8th Hussars) (I. Force) (France); Capt. (actg. Maj.) J. Ban Banks (A.S.C.); Lt.-Col. (actg. Col.) G. D. Bateman; Capt. (actg. Maj.) P. M. Beachcroft (K.A.); Lt.-Col. W. D. Beatty (R.E.); Maj. V. A. Beaufort, M.C. (Devon R.) (Egypt); Capt. (actg. Maj.) C. H. Bell; Capt. (actg. Maj.) A. Belton (Roy. Fus., S.R.); Capt. (actg. Lt.-Col.) H. R. Bently (Ches. R.); Chaplain Revd. R. S. B. Berry (I. Force) (France); Maj. P. Bishop, M.B.E.; Capt. (actg. Maj.) J. D. Blyth (R.E.); Lt.-Col. C. Bovill (R.A.) (Egypt); Lt.-Col. the Hon. C. M. P. Brabazon (I. Gds.); Lt.-Col. C. R. S. Bradley (I. Army); Capt. (actg. Lt.-Col.) J. S. T. Bradley (M.G.C.); Lt.-Col. (actg. Col.) E. F. Briggs, D.S.O.; Maj.(temp. Lt.-Col.) H. C. Brimsmead, M.C. (24th Bn., A.I.F.); Capt. (actg. Maj.) E. J. Briscoe (France), Maj. R. V. C. Brook; Maj. P. R. Burchell-Smith, L. A. Burrowes (Middx. R.); Capt. (actg. Maj.) V. Buxton (Leic. R.) (Mesopotamia).

Lt.-Col. C. F. Campbell, C.I.E. (I. Army); Lt.-Col. H. Campbell, D.S.O. (R. Fus.); Capt. (actg. Maj.) G. B. Chainey; Lt.-Col. A. H. Cheatle; Capt. (actg. Lt.-Col.) A. J. Child, M.C. (Lond. R.) (France); Maj. (actg. Lt.-Col.) A. J. Clark (Lond. R.) (France); Maj. H. Cockerell; Lt.-Col. R. H. Collier, D.S.O. (I. Force) (France); Capt. (actg. Lt.-Col.) L. B. Cook; Maj. F. E. Cooper; Maj. J. W. Cordingley; Capt. (actg. Maj.) L. H. B. Cosway (France); Lt.-Col. I. T. Courtney (R.M.L.I.); Lt.-Col. (actg. Col.) A. D. Cunningham.

Maj. (actg. Lt.-Col.) M. O. Darby, Capt. (actg. and /Hon. Maj.) J. H. Davies (Ches. R.); Capt. (actg. Lt.-Col.) M. Deacon (R.E.); Lt.-Col. G. C. St P. de Dombasle (Can. Forces); Lt.-Col. H. Delacombe; Capt. (actg. Maj.) R. B. C. M. T. de Poix (Norf. R.) (France); Maj. (actg. Lt.-Col.) J. Dickson (S.A. Engrs.); Maj. (actg. Lt.-Col.) E. Dixon-Spain (Hants R.) (Egypt); Maj. G. Dixon-Spain, M.C. (R. Fus.); Capt. (actg. Maj.) G. W. Dobson (10th Hussars); Capt. (actg. Maj.) M. R. Dobson, M.B. (R.A.M.C.); Maj. J. F. Dyer (E. Lancs.).

Capt. (actg. Maj.) A. S. Ellerton (France); Maj. A. T. Evans; Capt. (actg. Maj.) W. S. Evans (Welsh R.) (France); Capt. (actg. Maj.) R. M. Everett.

Maj. (actg. Lt.-Col.) G. F. Hay Faithful (I. Army) (France); Maj. (actg. Lt.-Col.) R. H. Farley (Cavly. Res.); Lt.-Col. W. S. Fetherstonhaugh (Can. F. Cps.) (France); Maj. S. J. V. Fill; Maj. H. F. Fisher (Canada); Capt. (actg. Maj.) H. G. Ford (France).

Capt. (actg. Lt.-Col.) P. Gadsby (A.O.D.); Maj. A. E. Gendle; Capt. (actg. Maj.) D. Goad; Capt. (actg. Maj.) G. L. Godden (France); Maj. R. E. Goddard; Maj. H. F. A. Gordon (Y. and L. R.); Maj. J. W. Gordon; Lt.-Col. E. H. Griffith (Leic. R.); Capt. (actg. Maj.) G. Gude (Paris).

Maj. (actg. Lt.-Col.) R. Hall, M.B.E. (Egypt); Capt. (actg. Maj.) W. W. Hall (France); Col. Revd. R. E. V. Hanson (D. Chaplain-in-Chief); Maj. W. B. Hargrave (Suff R., T.F.); Capt. (actg. Maj.) E. St C. Harne (R. Highrs.) (France); Maj. C. A. L. Harrison (Paris); Maj. A. P. Hartley (Ches. R., T.F.); Capt (actg. Maj.) F. H. Hawksford (Canada); Maj

E. M. W. Hearn; Lt.-Col. S. A. Hebden (France); Capt. (actg. Maj.) F. E. Hellyer (Hants. R., T.F.); Maj. C. H. A. Hirtzel (Salonika); Maj. A. H. Hogarth, D.C.M. (R.A.M.C.) (Mediterranean); Maj. G. E. W. Humphery; Capt. (actg. Maj.) A. Hunter (W. Kid. R.)

Capt. (actg. Lt.-Col.) D. Iron.

Capt. (actg. Maj.) D. C. James (Worcs. R.); Lt.-Col. F. H. Jenkins, M.C.; Capt. (actg. Maj.) J. F. Jones, D.S.C. (I. Force) (France); Maj. W. D. L. Jupp (France).

Capt. (actg. Maj.) M. Keegan, M.M. (R. Dub. F.) (Egypt); Lt.-Col. (A. Col.) F. H. Kirby, V.C., D.C.M. (R.E.); Capt. (actg. Maj.) W. C. Lambert (Notts. Yeo., T.F.); Lt.-Col. J. H. A. Landon, D.S.O. (I. Force) (France); Capt. (actg. Maj.) P. A. Landry (Can. Inf.); Maj. (actg. Lt.-Col.) C. E. Lawder (R.F.A.) (France); Maj. A. R. Layard (Adriatic); Capt. (actg. Maj.) F. W. H. Lerwill (R.E.); Maj. (actg. Lt.-Col.) A. Levick (G. Gds.); Capt. (actg. Lt.-Col.) O. Lindquist; Capt. (actg. Lt.-Col.) P. D. L. Lyall (Can. For. Corps) (France); Maj. O. G. W. C. Lywood (Norfolk R.).

Maj. (actg. Lt.-Col.) A. E. G. MacCullum (Inteil. Corps); Capt. (actg. Maj.) K. H. McLean (R.N.V.R.); Capt. (actg. Maj.) T. MacLeod; Maj. (actg. Lt.-Col.) G. M. G. Visct. Maidstone, D.S.C. (Flanders); Capt. (actg. Maj.) R. B. Mansell (4th Glouc., T.F.); Capt. (actg. Maj.) H. P. Maybury (France); Maj. H. A. Michell; Capt. (actg. Maj.) A. M. Miller, D.S.O.; Hon. Capt. (actg. Maj.) H. Milman (R.E.); Capt. (actg. Maj.) R. G. Mitchell (R. Scots); Maj. (actg. Lt.-Col.) R. Money (R. Lanc. R.); Capt. (actg. Maj.) E. F. Monk; Capt. (actg. Maj.) A. T. Moore; Maj. D. A. B. Morle; Lt.-Col. (Hon. Col.) L. Munro (Hamps. R.).

Maj. A. L. C. Neame (R.E.) (France); Capt. (actg. Maj.) C. G. Nevatt (France); Maj. H. R. Nicholl (I. Force) (France); Capt. (actg. Maj.) J. MacA. Nicolle (3rd S. Staffs.); Capt. (actg. Maj.) S. Nixon.

Lt.-Col. D. A. Oliver, D.S.O. (Adriatic).

Capt. (actg. Maj.) L. E. Palmer (York. and Lanc. R.); Maj. C. H. Parkes; Maj. S. C. Parr (Canada); Maj. R. H. Peck (11th E. Surr. R.); Lt.-Col. W. H. Pope; Maj. (actg. Lt.-Col.) E. W. Powell (Egypt); Asst. Comdt. Mrs. L. M. K. Pratt-Barlow, M.B.E.; Capt. (actg. Maj.) T. E. M. Pritchard; Maj. (actg. Lt.-Col.) W. J. D. Pryce, D.C.M. (Gord. Highrs.).

Capt. (actg. Maj.) C. F. Rasmusen; Maj. G. J. Read (4th N. Staffs); Lt.-Col. L. W. B. Rees, V.C., M.C., A.F.C. (R.G.A.); Capt. (actg. Maj.) T. S. Rippon (R.A.M.C.); Lt.-Col. C. MacI. Robertson (R.F.A.); Maj. (actg. Lt.-Col.) H. M. M. Robertson, M.C. (R.F.A.); Lt.-Col. R. S. Robinson; Lt.-Col. N. Roche; Maj. J. T. Rodwell (France); Capt. (actg. Maj.) S. G. Rome, M.C. (A. and S. Highrs.); Capt. (Hon. Maj.) A. A. Ross; Lt.-Col. A. Ross-Hume (Sco. Rif.); Maj. (Hon. Lt.-Col.) the Hon. V. A. F. V. Russell (Beds. R., T.F.) (I. Force) (France).

Maj. P. R. Samson; Capt. (actg. Maj.) E. Selby; Maj. J. P. C. Sewell (France); Capt. (actg. Maj.) H. T. Shaw; Maj. A. F. Sidgreaves; Maj. G. E. Smith (E. Yorks); Capt. (actg. Maj.) J. D. Smith; Maj. S. W. Smith (R.A.); Capt. (actg. Maj.) W. E. Smith (France); Capt. (actg. Maj.) G. Somers-Clarke (Mesopotamia); Capt. (actg. Maj.) D. C. L. Speed (K.R.R.C.); Capt. (actg. Maj.) F. Steel (Essex R.); Maj. J. V. Steel (R.E.); Capt. (actg. Maj.) F. D. Stevens (M.G. Corps); Capt. (actg. Maj.) G. Stevens (France); Capt. (actg. Maj.) J. Stewart (R. Scots. F.); Capt. (actg. Maj.) A. H. Stradling (Gord. Hdrs.) (France); Lt.-Col. L. H. Strain, D.S.C.; Capt. (actg. Lt.-Col.) H. W. Stratton (6th D.G.); Capt (actg. Maj.) L. M. P. Sulivan (R.E.).

Maj. (actg. Lt.-Col.) G. H. Thomson (Ægean); Lt.-Col. G. E. Todd (Welsh R.) (Salonika); Maj. H. C. Tweedie, D.S.O. (N. Staffs)

Maj. (actg. Lt.-Col.) F. H. Unwin.

Lt.-Col. R. H. Verney.

Capt. (actg. Maj.) W. J. Waddington (G. Gds.); Capt. (actg. Maj.) W. Wade (Middx. R.); Capt. (actg. Lt.-Col.) H. N. Walker, M.C. (Welsh R.); Lt.-Col. A. T. Watson (Nigerian R.); Maj. G. W. Williamson, M.C. (Manch. R.); Capt. (actg. Maj.) H. A. J. Wilson; Maj. (actg. Lt.-Col.) A. B. Winch (R. Scots Greys); Capt. (actg. Maj.) C. W. Wise, M.C. (A.S.C.) (Salonika); Maj. T. Worswick (France); Capt. (actg. Maj.) H. E. F. Wyncoll, M.C. (Notts and Derby R.).

Maj. (actg. Lt.-Col.) H. E. F. Yates, M.C.; Capt. (actg. Maj.) C. F. Yeomans; Capt. (actg. Maj.) A. Young.

M.B.E. (Military Division).

Capt. W. J. Adkins (Glouc. R.); Lt. (actg. Capt.) S. I. Amor (France); Lt. J. C. Andrews; Lt. (Hon. Capt.) B. O. Angell (France); Lt. W. M. Aniot (Egypt); Lt. H. J. Axten (R. Fus.).

Capt. A. H. S. Baker (Egypt); Capt. P. C. Barber (Chaplain); Capt. H. O. Barnaby (R.F.A., T.F.); Lt. (actg. Capt.) P. H. Barr; Admstr. Miss C. T. Bayley; Capt. B. J. Beeton; Capt. R. Belli-Bivar (R. I. Fus.) (I. Force, France); Capt. C. B. Belt, M.C. (S. Staffs. R.); Capt. H. L. Betteridge; Lt. (actg. Capt.) J. P. P. L. Biggs (France); Capt. E. I. M. Bird; Lt. H. Booker; Sec. Lt. (actg. Capt.) J. A. Bonnyman (Welsh R., T.F.) (Egypt); Lt. (actg. Capt.) W. Bowring (France); Lt. H. E. Brackenboro; Lt. (actg. Maj.) C. J. Brockbank; Capt. J. Brown, M.C. (Egypt); Capt. W. E. G. Bryant (R. Fus.); Lt. (actg. Maj.) T. L. F. Burnett; Sec. Lt. (Hon. Lt.) P. J. Burns (R.G.A.); Capt. W. L. Burt (Essex R.) (France); Lt. (actg. Capt.) L. C. Bygrave (I. Force, France).

Lt. D. Cairns (High. Cyc. C.) (France); Lt. A. E. Cambridge; Lt. (actg. Capt.) M. Campbell (R. W. Kent R.); Capt. E. P. Carmody (R.A.M.C.); D. Admstr. Mrs. M. Carnlev; Capt. A. W. Carter, D.S.C. (France); Lt. (actg. Capt.) H. Cassels (Canada); Sec. Lt. (actg. Lt.) W. R. Castings; Capt. J. Chambré, M.D. (Egypt); Capt. C. K. Chandler; Sec. Lt. (actg. Lt.) B. Cheeseman (France); Capt. S. Clare (France); Lt. (Hon. and actg. Capt.) P. Colheck (Northd. Fus.) (Egypt); Lt. (actg. Capt.) R. A. W. Collet; Capt. W. T. Cooper (Aus. F.C.) (France); Capt. B. F. Crane (I. Force, France); Lt. (Hon. Capt.) A. T. Cranmer (Middx. R., T.F.); Lt. (actg. Capt.) W. E. Cranmer (Middx. R.); Capt. H. L. Crichton (A.O.D.); Lt. (actg. Capt.) R. L. Crofton; Capt. W. G. M. Crothers (Suff. R.) (Egypt); Lt. (actg. Capt.) S. Currington (W. Rid. R.); Sec. Lt. (Hon. Lt.) J. D. C. Curtis, M.C. (R. Lancs. R.).

Lt. (actg. Capt.) F. Dance (France); Lt. J. H. Dand; Sec. Lt. (actg. Capt.) H. Dawes; Lt. (actg. Capt.) W. Dawson; D. Admstr. Miss F. Day; Lt. G. E. M. Dean (Can. Fd. Artv.); Capt. R. Donald (France).

Sec. Lt. (actg. Lt.) F. G. Eckford; Lt. R. W. Everett.

Sec. Lt. (actg. Capt.) H. K. Fairbrother; Capt. T. Fawdey (N. Lancs. R.) (Egypt); Sec. Lt. C. A. Firmin (5th Sqdn.) (France); Sec. Lt. (actg. Lt.) M. B. Fitzgerald (France); Lt. (actg. Capt.) J. R. Frankish (France); Sec. Lt. L. Freeborn (Ægean); Capt. S. T. Freeman (Ægean); Capt. O. H. Frost, M.C. (Middx. R.) (France); Capt. A. A. Fry (France); Capt. N. B. Fuller (Mesopotamia); Sec. Lt. A. R. Fulton; Lt. (actg. Capt.) R. G. Fyfe (Salonika).

Lt. (actg. Capt.) E. W. Geer; Capt. T. M. Gerrard; Lt. (actg. Capt.) H. H. Giles; Capt. S. C. Godfrey, M.C. (R. Scots Fus.); Lt. (actg. Capt.) G. F. Golding (France); Sec. Lt. (actg. Capt.) P. C. Graham (N. Staffs.); Lt. (Hon. and actg. Capt.) F. Grave (Lond. R.); Capt. A. G. Griggs; Capt. A. W. W. Groome (Norfolk Yeo.); Capt. P. E. Gwyer (R.M.A.); Capt. T. C. Gordon (I. Force, France).

D. Admstr. Mrs. M. Halcrow; Capt. W. E. Hayward; Capt. L. Henshaw



An Aerial Photograph of London, showing the Admiralty Arch and Trafalgar Square. This Photograph was taken during the March of the Overseas Troops through London some time since. The black spots are the crowd waiting for the Troops and do not indicate the usual march formation of Colonial Units.

(S. Lancs. R.); Lt. G. A. Hill, M.C. (Manch. R.) (Russia); Lt. (actg. Maj.) C. E. Hodgson (R. War. R.); Capt. H. Hulbert.

Capt. F. Jefcoate (Suff. R.) (Egypt); Sec. Lt. (actg. Maj.) H. Jones.

Capt. H. R. Kavanagh (R. I. Fus.) (France); Lt. W. G. Kewley (France); Lt. (actg. Capt.) A. G. Knight; Sec. Lt. (actg. Lt.) J. M. Knight (France); Capt. the Hon. E. G. W. T. Knollys (Lond. R.) (France); Capt. E. G. Knox (Aus. F.C.) (France).

Lt. (actg. Capt.) J. W. Langmuir (Canada); Lt. (actg. Capt.) E. J. Langridge (N. Staffs. R.) (France); Capt. E. P. Leigh-Bennett; Capt. A. F. Livingstone (K.R.R.C.); Lt. (temp. Capt.) R. E. I. Lott (West Ontario R.).

Lt. P. A. McBain (Aus. F.C.) (Palestine); Sec. Lt. R. D. G. Macrostie (Egypt); Lt. R. Macdonald (Liverpl. R.); Sec. Lt. (actg. Lt.) W. J. Maley; Capt. H. C. Mallett; Capt. D. T. W. Manwell (Aus. F.C.); Sec. Lt. A. P. Marchant, D.S.M. (I. Force) (France); Lt. L. J. Mars (York Hrs., Yeo.); Capt. T. B. Marson (Lond. Yeo.) (I. Force) (France); Lt. J. B. Mawsley (Can. F.C.) (France); Lt. (actg. Capt.) K. A. Meek (W. Yorks. R.); Sec. Lt. (Hon. and actg. Lt.) D. R. Mitchell (France); Lt. H. S. Morris (Cold. Gds., S.R.) (France); Lt. (actg. Capt.) P. H. Morrissey; Admstr. Miss D. C. Muir; Lt. (actg. Capt.) F. Murphy.

Lt. (actg. Capt.) T. H. Nesbitt (France); D. Admstr. Mrs. F. M. S. Newton; Capt. W. S. Newton-Clare (France); Capt. B. J. Nicholson; actg. Comdt. Miss C. Noel; Lt. H. P. Northcote (W. Yorks.); Capt. W. E. Nuttall.

Capt. G. Palmer (Devon R.); Lt. (actg. Capt.) G. W. Panter (R. T. Rif.) (Adriatic); Admstr. Miss K. Pearce; Lt. (actg. Capt.) P. P. C. Penberthy (Shrops. L.I.); D. Admstr. Mrs. G. Pertwee; Lt. (actg. Capt.) F. Petch (France); Sec. Lt. C. W. Phipps (France); Capt. D. W. Pinckney; Sec. Lt. (actg. Capt.) J. M. Pinkerton; Lt. (actg. Capt.) E. E. Porter, D.C.M. (Som. L.I.) (France); Lt. F. H. Postlethwaite; Lt. F. J. B. Powell; Sec. Lt. W. P. B. Pugh.

Sec. Lt. J. C. Raine (France); Admstr. Mrs. A. Rathbun; Sec. Lt. (actg. Capt.) D. M. Rees (Adriatic); Capt. W. Ricketts (Dep. Gds.); Capt. A. Ridley (Dep. Gds.); Capt. E. Rivers-Smith (Middx. Yeo.); Capt. J. Robinson; Lt. (Hon. and actg. Capt.) G. W. Rogers (N. Staffs.); Lt. G. O. Roner; Lt. (actg. Capt.) A. L. M. Ross (France); Lt. (Hon. Capt.) A. A. Rowe (R.E.); Lt. (Hon. Maj.) C. W. Rowe (Hants Cyc. Bn.), (Egypt).

Capt. L. H. Scandrett, M.C. (Canada); Capt. A. E. Siddons-Wilson; Lt. (actg. Capt.) R. J. Sladden, D.C.M.; Capt. A. G. H. Smart, M.B. (R.A.M.C.) (France); Capt. H. Stansfield (France); Capt. D. S. Stevenson, M.B. (Flanders); Sec. Lt. J. G. McK. M. Stronach; Lt. (actg. Capt.) P. Susans; Sec. Lt. (actg. Capt.) J. Sutherland (Adriatic); Lt. (actg. Capt.) W. Sutherland (Middx. R.) (Egypt); Capt. L. B. R. Swan, Sec. Lt. (actg. Lt.) R. Swan (France); Lt. (actg. Capt.) F. A. Swoffer (Middx. R.) (France).

Sec. Lt. A. H. Taylor (France); Capt. B. A. Taylor; Capt. L. E. Taylor (R.A.); Hon. Lt. (actg. Capt.) H. H. Thomas, D.F.C. (Salonika); Admstr. Miss E. Thomson; Capt. A. P. Thurston; Lt. (actg. Capt.) E. Trist; Lt. (actg. Capt.) S. H. Twining (Middx. R.).

Lt. (actg. Maj.) H. Waddington (Manch. R.); Capt. H. C. Washburn (Lond. R.); Sec. Lt. (actg. Maj.) F. Waldron (Worcs. R., T.F.); Lt. (actg. Capt.) H. F. Walker; Lt. (actg. Capt.) P. Warburton (R.G.A.); Capt. W. G. J. Wardle; Lt. (actg. Capt.) A. M. Watson (Shrops. L.I.) (France); Lt. (actg. Maj.) W. Watson (Highl. Cyc. Co.); Capt. W. McL. Watt (R. Highrs.); Lt. (actg. Capt.) F. M. T. Watts (Worcs. R.) (Mesopotamia); Capt. D. C. Wayles; Lt. J. C. Western (France); Capt. F. T. Williams (W. Yorks. R.); Lt. (actg. Capt.) C. A. Williams (France); Capt. O. Williams; Lt. (actg. Capt.) A. McC. Wilson (H.L.I.) (France); Capt. A. M. Wilson (4th Gord. Highrs.) (I. Force) (France); Capt. F. A. Woolley; Lt. W. T. Wright (Can. Fees.) (I. Force) (France).

Sec. Lt. H. J. Young (France).

HON. M.B.E.

Mulaim Tani, Mahmud Effendi Mustafa Maher, 4th Bn., Egyptian Army, attd. R.A.F., Helmia, Egypt.

WAR OFFICE, June 5th.

The following are mentioned for distinguished and gallant services during the period from Oct. 1st, 1918, to March 1st, 1919, in a dispatch which has been received by the Secretary of State for War from Lieut.-Gen. Sir G. F. Milne, K.C.B., K.C.M.G., D.S.O., Commanding-in-Chief, British Salonika Force:—

ROYAL AIR FORCE.

Capt. (actg. Maj.) F. A. Bates, M.C. (Denbigh Yeo., T.F.).
Lt. (actg. Capt.) R. G. Fyfe.
Lt. F. L. Goodacre.
Maj. C. H. A. Hirtzel.
Capt. (actg. Maj.) W. B. McBain, M.C. (R.F.A., T.F.).
Lt.-Col. G. E. Todd (Maj., Welsh R.).
Capt. F. G. M. Williams.
Capt. (actg. Maj.) C. Wise, M.C. (R.A.S.C., S.R.).
5755 Ch. Mech. J. W. Airey, 17433 Ch. Mech. E. C. Aston, 3279 Serjt. Mech. W. J. Blatchford, 10659 Serjt. Mech. W. Chesmore, 2075 Serjt. Mech. J. G. Day, 1751 Serjt. Mech. A. Dingle, 3917 Cpl. Mech. W. C. Dunn, 8146 Flt. Clk. E. A. A. Evans, 7677 S.M. L. R. Fears, 13181 1st A.M. F. A. Fryer, 12575 Serjt. Mech. (actg. Ch. Mech.) H. E. Green, 21092 Serjt. Clk. S. V. Hicks, 93769 Serjt. Mech. J. Johnston, 36440 1st Cl. Clk. (actg. Cpl. Clk.) A. March, 42137 Flt. Clk. H. Moss, 36612 Serjt. Mech. J. H. Partridge, 18404 Serjt. Clk. J. E. Pays, 3651 Serjt. Mech. A. H. Pottier, 3872 Ch. Mech. V. P. C. Rook, 19196 1st A.M. F. C. Swain, 22111 Serjt. Mech. A. Thornley, 6476 Serjt. Clk. W. A. Wicks.

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, June 5th.

The Prince of Wales, attended by Capt. the Lord Claud N. Hamilton, visited the works of the Sopwith Aviation Company this morning.

His Royal Highness, attended by Captain the Lord Claud N. Hamilton, was present at a luncheon given by Major-General the Right Hon. J. E. B. Seely, M.P. (Under Secretary of State for Air) at the House of Commons.

BUCKINGHAM PALACE, June 6th.

H. Darley, Royal Air Force, had the honour of being received by The King this morning.

BUCKINGHAM PALACE, June 7th.

The King held an Investiture in the Quadrangle of the Palace at 11 o'clock this morning.

The following were severally introduced into the presence of The King, when His Majesty invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:—

THE MOST DISTINGUISHED ORDER OF SAINT MICHAEL AND SAINT GEORGE.—Companions.—Brig.-Gen. James Weir, R.A.F., and Lieut.-Col. Grahame Christie, R.A.F.

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE.—Commander.—Military Division.—Lieut.-Col. Francis Muecke, R.A.F.

THE DISTINGUISHED SERVICE ORDER.—Major Andrew MacElroy, U.S. Air Service; Brig.-Gen. Frederick Willcox, R.A.F.

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE.—Officers.—Military Division.—Lieut.-Col. Alfred Hellawell, late R.A.F.; Major Herbert Corin, R.A.F.; Major Richard Heyn, R.A.F.

Member.—Military Division.—Lieut. Howard Sampson, R. Warwickshire Reg., attd. R.A.F.

Major-Gen. Sir Hugh Trenchard, K.C.B. Chief of the Air Staff), had the honour of being received by the King this morning.

OFFICIAL COMMUNIQUES.

On June 3rd the War Office issued the following statement concerning the Archangel front:—

On May 30th, on the Vaga, one of our aeroplanes, dropping bombs, obtained a direct hit on an enemy barge.

THE CASUALTY LIST.

AIR FORCE.

Reported June 6th.

KILLED.—Barclay, Sec. Lt. J. G., R.A.F.
Barker, Capt. L. I., R.A.F.
Jacobi, Lt. E. W. S., R.A.F.
McEachran, Lt. N., R.A.F.
Prince, Sec. Lt. F. G., R.A.F.
Smith, Sec. Lt. H. C., R.A.F.
Spratt, Sec. Lt. S., R.A.F.
Weaver, Lt. H. J., R.A.F.

DIED OF INJURIES.—Gibbs, Sec. Lt. S. H., R.A.F.
Jemmesson, Sec. Lt. G. E., R.A.F.
Rawlings, Capt. P. T., R.A.F.
Turner, Lt. B. E. N., R.A.F.
Wright, Lt. C. V. C., R.A.F.
Wyatt, Sec. Lt. W., R.A.F.

MISSING.—Jefferson, Capt. E. B. B., R.A.F.

PERSONAL NOTICES.

MILITARY.

DEATHS.

JEFFERSON.—Capt. Elgie B. B. Jefferson, 1st The King's (Liverpool) Regt. and R.A.F., who was killed on May 15th while carrying aerial dispatches to Paris was the husband of Muriel Jefferson, and only son of Mr. and Mrs. Jefferson, of "Ballahott," Isle of Man.

RANSOM.—Sec. Lieut. Hubert W. Ransom, R.F.C., who was officially reported missing is now presumed to have been killed in action on March 27th, 1918. He was the third son of Mr. and Mrs. Francis Ransom, of "The Chilterns," Hitchin, Herts.

MARRIAGE.

KEMP—SNOW.—On June 2nd, at St. Paul's, Knightsbridge, Capt. W. Kemp, A.S.C., R.A.F., was married to Margery Olga, only daughter of the late Colonel E. B. Snow, R.M.L.I., and of Mrs. Snow, 8, Pont Street, by the Rev. F. L. Boyd.

AIR FORCE.

DEATHS.

BANNERMAN and WILSON.—The "Nation Belge" of June 9th states that a British aeroplane performing the postal service between Cologne and Folkestone, carrying Lieut. Bannerman, R.A.F. (pilot), and Lieut. Wilson, R.A.F. (observer), crashed at Floreffe, near Namur. Both aviators were killed.

The "Soir" gives the following version of the accident:—

The machine crashed down at Soye, near Floreffe. It first made a spiral dive and then turned completely over. The pilot, who was not fastened into his machine, was thrown out 250 yards from the observer, who was pinned down by the engine. There were no mails on board.

ENGAGEMENTS.

IRVING—WOOLNER.—The engagement is announced of Capt. Laurence Irving, late R.A.F., only son of Mr. and Mrs. H. B. Irving, of 10, Sudbury Hill, Harrow, to Rosalind Frances, fourth daughter of Mr. Hugh Woolner, of 23, Stanley Crescent, W.11.

OXLAND—DUMBLETON.—The marriage arranged between Capt. B. D. Oxland, R.A.F., and Miss Thelma Dumbleton will take place at Bloxham, Banbury, on Wednesday, June 18th.

MARRIAGES.

DAWES—UPTON.—On June 3rd, at St. Mary's, Market Drayton, Capt. Richard Wilkinson Dawes, R.A.F., was married to Ruby Grace Apelina, only daughter of Mr. and Mrs. J. St. C. Upton, of Market Drayton, Shropshire, by the Ven. Archdeacon Lambart, assisted by the Rev. F. S. Girdlestone, rector of Moreton Gay, and the Rev. R. L. White, vicar of the parish.

KINGSMILL—MORANT.—On June 3rd, at St. Stephen's Church, Dulwich, Capt. Geoffrey Major Kingsmill, R.A.F., only son of Mr. and Mrs. Kingsmill, of Herne Bay, was married to Constance Margaret, widow of the late Capt. Gerald Alex. Morant, M.C., by the Rev. W. F. James.

MURRAY—LAND.—On June 2nd, at St. Andrew's Church, Westminster, Thomas Graham Murray, D.F.C., son of the late Capt. J. S. Murray, of The Sandpatch, Wentworth Falls, New South Wales, was married to Mabel Isabel, only daughter of George Land, Esq., and Mrs. Land, Hastings, New Zealand, by the Rev. E. St. C. Schomberg.

BIRTHS.

LANE.—On June 4th, at 1, South Eaton Place the wife of Major R. C. Lane, R.A.F., of a daughter.

MACKAY.—On June 7th, at a nursing home, the wife of L. Hugh Mackay, R.A.F., of Whitecroft, Beckenham, of a son (Peter Lewis).

"THERE ARE NONE SO BLIND——"

Once upon a time an Army officer of somewhat advanced rank had occasion to lunch at a Naval mess. The Naval mess possessed a white ensign.

"I see," said the Army officer, "you have the flag of the Royal Yacht Squadron."

The mess were troubled and annoyed.

A polite N.O. proceeded to explain: "It's ours really, you know; we only lend it to them."

The Army officer—who was really old enough to know better, although his advanced rank precluded the possibility of such knowledge—went home and told the tale against the Navy, as an example of their stupidity and "sloppy habits."

So much has been said lately concerning the above-mentioned "sloppy habits" that it is a great relief to those who still hold their faith in the Royal Navy—despite the little mishaps of war-time—to read that so far as airships are concerned the Navy has been anything but sloppy.

In 1913 the Army—always so perfect and far-seeing—did not think sufficiently well of their airships to keep them, but handed them over to the despised Navy, who accepted them gratefully, developed them, and despite the sneers of a discomforted Army, calmly proceeded with the day's work to the detriment of the German Submarine Service.

It was not the fault of the Navy that an unkind and thoughtless Government saw fit to waste money upon things other than airships in the early days of the war. The Navy suffered for it in many ways, for it was not to be expected that the British Public should blame their chosen representatives while it was possible to blame the Service that was the chief sufferer.

But those days being past, the Navy would appear to be coming into its own in the matter of airships. There are several ships under construction and several others have just completed tests, and if only a Pacifist Government does not insist upon their demolition, in time the Navy should have quite enough airships for its purpose.

During the war little has been heard of the Airship Service and—in an age of newspaper advertisement of the less worthy people—that in itself is a good sign. It was a service run by Naval personnel, and, one believes, is even yet strictly Naval in its outlook.

The sea is obviously the right place for airship reconnaissance, as the Germans proved beyond all doubt, and the Navy, for all their "sloppy habits," realised this and took advantage of it.

Therefore it is possible that the aforementioned Army officer judged the Navy a little hastily, and that, after all, the stupidity of the R.N. is only a pose assumed for the purpose of hiding the skill which lies beneath.—S. F. B.

THE ATLANTIC FLEET.

On the Active Force of the Home Station a Flying Squadron under Rear-Admiral Sir R. Phillimore, consisting of "Furious" (flag of rear-admiral), "Argus," "Vindex," and "Vindictive," has been formed as a unit of the Atlantic Fleet.

AVIATION IN AFGHANISTAN.

The following is among the armistice terms presented to the Afghanistan Government by the Indian Government:—

Our aeroplanes shall be allowed to reconnoitre over the Afghan lines, but not to bomb.

A message, dated June 2nd, states that aeroplanes co-operated successfully in the relief of Fort Thal by bombing and machine-gunning the enemy holding the ridges.

THE REPATRIATION OF R.A.F. OFFICERS.

The Air Ministry announces that demobilised officers of the R.A.F. who are entitled to repatriation, but have made their own arrangements for passages over seas have no claim to a refund of the expense incurred or of the cost of a public passage.

Instead of making their own arrangements officers should apply for passage to the Officer i/c R.A.F. Repatriation Records, Winchester, who will make provision for a public passage for anyone who has been serving in the Royal Air Force and who is entitled to repatriation.

THE SEARCH FOR MISSING AVIATORS.

A special unit of the Royal Air Force with 20 officers on the establishment crossed to France on June 5th. These officers will be attached to Army formations and their main duty will be searching for officers and other ranks of the Royal Air Force who have been listed as "missing." It is considered possible that some pilots may still be in isolated districts, unable to move owing to injuries and sickness.

THE R.A.F. AND MOTOR-CARS.

The Interim Report of the Parliamentary Select Committee on National Expenditure which will be published during the week, contains references to the private use of Government motor-cars by R.A.F. officials. It is stated that these cars have been not only in London, but also in the provinces, used for conveying officials to dinners, the theatre, and for pleasure trips into the country.

THE ROYAL NAVAL, MILITARY, AND AIR FORCE TOURNAMENT.

Representatives of the W.R.N.S., the Q.M.A.A.C., the W.R.A.F., and the Women's Legion will take part in the Royal Naval, Military, and Air Force Tournament at Olympia on June 26th.

ATHLETICS IN THE R.A.F.

The R.A.F. football eleven which is touring Holland played a game at Amsterdam on June 6th against a team representing Holland, which resulted in a draw, each side scoring one goal.

After the unexpected drawn game on June 5th the R.A.F. Association football team on June 8th played a second match with the Dutch Swallows and won by 3 goals to 2. The Dutch left inside, van Diermen, scored the first goal for the home team after 10 minutes' play with a clean shot. A blunder by the Dutch left back let in Halse to make the score one all. Before half-time Cannon, after some clever combination, gave the R.A.F. the lead.

In the second half both R.A.F. backs were beaten by the Dutch centre forward, Buitenweg, who scored a brilliant goal. Shortly afterwards Tomkins from a free kick scored the winning goal.

This time no international players were included in the Dutch team. The scientific game of the airmen was appreciated highly.

FLYING IN INDIA.

Major H. A. Tweedie, R.A.F., arrived at Simla from Ambalia on May 4th, making a successful landing on the Annadale gymkhana ground. This is stated to be the first flight made over the Himalayas.

LONG-DISTANCE FLYING.

Lieut.-Col. Wilson, General Staff, Mesopotamia, recently flew from Mosul, on the Tigris above Baghdad, to Cairo on a D.H.10 recently. The route taken constituted roughly 1,050 miles. Three stops were made altogether. From Cairo Col. Wilson continued the journey by train and steamship.

WIRELESS TELEPHONY.

On May 13th various experiments in wireless telephony were carried out in London between an aeroplane flying low over the Thames and Major Erskine Murray, R.A.F. The lecture hall of the Institute of Civil Engineers was used as a receiving station.



(Photograph by Russell.)

Major-General E. L. Ellington, C.B., C.M.G., Controller-General of Equipment, who has just been appointed Commander of the Order of the British Empire.

A NEW CIRCUIT OF BRITAIN FLIGHT.

The following is an extract from the official account of the recent R.A.F. tour, part of which has already been described to the Press :—

A Handley Page (two 350 h.p. Rolls-Royce engines) carrying two pilots (Major K. R. Park, R.A.F., and Captain Stewart, R.A.F.), two navigators (Major B. E. Smythies and Lieut. Wilson), three engineers and fitters, and two wireless operators.

The flight was begun from No. 1 R.A.F. School of Navigation at Andover at 2.15 a.m. The first stage was to Waddington *via* Portsmouth, along the coast past Brighton to Ashford and Canterbury, and thence by Shoeburyness, Clacton, Lowestoft, Hunstanton, and across the Wash to Waddington, which was reached at 9 a.m.

Certain necessary engine adjustments were effected here, and the flight resumed at 1.28 p.m. on the same day. The weather had improved somewhat, and Grimsby, Scarborough, and South Shields were passed in better visibility. By the time Alnwick was reached at 5 p.m., however, conditions had deteriorated rapidly. Rain set in, with low clouds and a strong westerly wind, which rendered it necessary to descend from 3,000 to 800 feet and then to 350 feet, at which height St. Abb's Head was rounded. It had been intended to proceed to Longside on this stage, but in view of the weather conditions the machine was turned west to Edinburgh and a landing was effected at Turnhouse at 6.45 p.m.

The following day the machine got away again at 11.50 a.m., and by way of Arbroath, Aberdeen, Longside, Inverness, and the Mull of Kintyre, Belfast as made at 7.5 p.m. Once again the weather was bad and visibility so poor that the aerodrome of Aldergrove could be picked up.

Aldergrove Aerodrome was left at 1.35 p.m. the next day and a course set for Dublin and thence to Bardsey Sound, which involved an oversea passage of 68 miles. Newquay was the next point made, and the day's stage was completed at Pembroke at 5.50 p.m., where some further engine adjustments were effected. The last day of the circuit provided the best weather. An early start was made at 4.26 a.m., and after another oversea passage of 17 miles Burry Holmes was reached. Thence the coast was followed to Boscastle, where a course was set inland to Bodmin and Plymouth, and then along the coast once more to Bournemouth before turning in to Andover, thus completing the circuit at 9.32 a.m. on the fourth day.

The average air speed maintained throughout was 66 miles per hour, while each day's run averaged 450 miles.

Another very successful night flight, also made from this same R.A.F. Navigation School, was from Andover to Baldonnel (Dublin). The night was intensely dark, and it was practically impossible to pick up landmarks. Accordingly the flight was done on compass bearings, due allowance being made for "drift." The calculations had been so accurately worked out and the course so skilfully set that the navigator brought the machine out directly over Dublin. The entire journey was completed in 6¾ hours.

WIRELESS TELEPHONY.

The following has been received from the Air Ministry :—

The extraordinary value of wireless telephony for directional purposes in connection with aircraft has been emphasised recently in its relation to night-flying. It often happens, of course, that in daylight inter-communication between planes, or between wireless stations and aircraft is unnecessary, but in flying across country at night the use of the wireless 'phone will certainly become more and more efficacious.

Some details are now available of a test carried out during a recent night flight from Kenley to Paris in a Rolls-Royce-engined Handley Page. This in no way constitutes a record, but is, nevertheless, interesting, as indicating what is being done as a matter of routine. Wireless telephony has now been definitely adopted as a means of ground to air communication and vice versa on the London-Paris route, and the test in question was made with one of the first machines on this service fitted for the purpose.

Communication was opened as soon as the Handley Page had obtained height, and, after speaking to the ground station, the receiver was turned in and speech was very clearly heard from Kenley. The officer conducting the test emphasises in his report speech quality and strength, and states that he easily recognised the voice as that of an officer known to him To a distance of about 35 miles the strength of signals was so great that speech from the machine could be clearly heard at Kenley with the receiver laid upon the table. At 50 miles it was still distinct and constant, and was heard until the aeroplane was crossing the Channel and was in touch with Marquise—the first ground station on the French side.

On the return journey conversation between the machine and Marquise was again picked up at Kenley, and the latter station itself, was in communication with the machine 30 minutes before it landed

One of the recent developments in this connection is the production of an aeroplane set which can be converted within a few moments for transmission of either voice or Morse signals.

TO HOLLAND BY AIR.

A few days ago, Dutch seaplanes made the flight for the first time to British shores, arriving at Felixstowe for the purpose of taking back to Holland two Dutch medical officers who had been visiting this country to investigate the British system of medical examination of pilots.

On the return journey, as neither of the Dutch seaplanes—two-seater float machines of the Friedrichshafen type—were equipped with wireless, a British F.5 flying-boat (two Eagle VIII Rolls-Royce engines) was detailed to escort them as far as Scheveningen.

At this place the Dutch seaplanes turned inland, and, following the canals, reached Amsterdam, where they alighted safely. The British machine returned to Felixstowe.

Both the out and return journeys occupied 1 hour and 55 minutes, and throughout the whole trip the F.5 was in wireless communication with its base at Felixstowe.

THE SWEDISH AIR SERVICES.

The Swedish Government has appointed a Commission to examine proposals with the object of systematising arrangements in the Military Aviation Service concerning material and the training of fliers as well as the investigation of the causes of accidents to military aeroplanes. Another Commission has been appointed to deal with similar matters in connection with the Naval Air Service.

Capt. Luebeck, the Chief of the Swedish Naval Flying Corps, is shortly coming to England to study naval aviation and to purchase flying material. He will later visit France and Italy. Capt. Luebeck will be accompanied by Capt. Werner.

ANOTHER FLYING COMPETITION.

The Portuguese Government has officially entered the lists of prize-givers. The first military aviator who flies from Lisbon to Rio de Janeiro within a period of 78 hours will receive a prize of £4,000. A sum of £40,000 has been allotted towards the organisation of the flight.

DESERTION BY AEROPLANE.

On June 7th a Russian aeroplane was observed over Sainio railway station, in the province of Viborg. It subsequently landed a short distance from the station. The aviator, who was obliged to land owing to lack of petrol, was taken prisoner.

Examination proved that he was a lieutenant named Gurland, belonging to General Denikin's Army. He started that he had been in the Bolshevist service but fled. He took the aeroplane in Petrograd intending to give it to the White Guards.

SWISS MILITARY AVIATION.

The Swiss Military Authorities have evolved a very neat little two-seater biplane, specially constructed with regard to local conditions, i.e., a country in which "high or bold relief" is the chief physical feature. Of course, it cannot compare with the scouting machines produced during the war by the various belligerents.

A Swiss-made motor of 190-h.p. is fitted. It is well to remember that Switzerland having no "breadth" and no intention of fighting, did not need machines with a large radius of action.

At the end of 1918, the Authorities commenced the demobilisation of the Swiss Armies; only a few score pilots have been retained, and these are obliged to do eight hours' flying per month in order to qualify for their £2 per hour bonus. The pre-war pilot, now a Cavalry Lieutenant, Bider, is the chief pilot.

Most of the Military aviators have formed themselves into an association to defend the national interests against German penetration.

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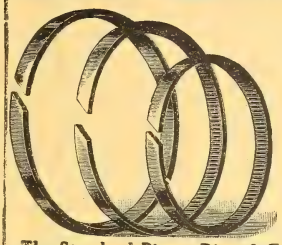
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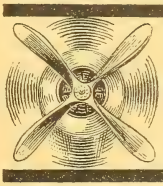
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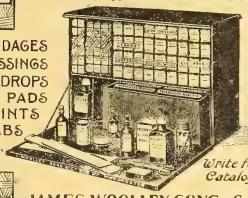
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ON THE RE-ORGANISATION OF THE R.A.F.

On June 14th the Independent Force, R.A.F., gave a dinner to itself and a few fortunate friends to commemorate its efforts in the great war, and apparently also to lament the fact that the war was stopped before it was ready to bomb Berlin. Happily the Chief of the Air Staff, Major-General Sir Hugh Trenchard, K.C.B., D.S.O., was able to take the chair, as was fitting for the former G.O.C., I.F., R.A.F. Among those present were Captain His Royal Highness Prince Albert, K.G., General Newall, General Courtney, Lieut.-Col. Christie, Lieut.-Col. Beatty, and most of the squadron commanders who did such fine work under such difficult circumstances in the Independent Force.

General Trenchard made the gathering an opportunity for giving an outline of the future development of the R.A.F. As he explained, it was as unofficial an announcement as his position as C.A.S. permitted, but it must be of the most intense interest to all officers and men of the R.A.F., and therefore it is quite the most important event of the present period.

It was particularly apposite that the announcement should be made to the Independent Force, for that force perhaps came nearer to being what the R.A.F. of the future must be than did any other section of the R.A.F., in that the units of the R.A.F. working with the Navy were still almost purely Naval at the end of the war, and those with the Army were distinctly part and parcel of the Army. The I.F., on the other hand, had already begun to take on itself an independence which justified its name.

A Glance at the Past.

In proposing the toast of the Royal Air Force, General Trenchard gave a brief review of the past. He reminded those present that the Independent Force was the only force not run by the Navy or Army, though it was animated by the same spirit as the old parent services. They would remember that it consisted of the old 8th Brigade, R.F.C. While it was still the 8th Brigade, and before it became the I.F., it dropped 107 tons of bombs, made 57 day raids and 67 night raids, bombed 156 different targets, and also got to Cologne for the first time.

All this work was done in one of the worst of winters by 55 Squadron under Major Baldwin; by 100 Squadron —the first squadron ever formed essentially for night bombing—under Major Christie; and by that hastily-formed 216 Squadron under Major Savory. In May they were joined by 99 Squadron under Major Pattinson. The 8th Brigade was formed from what had been the 41st Wing.

The Spirit of the Independent Force.

General Trenchard said that he believed that when the Independent Force was formed it put still more keenness into the squadrons. The pilots never seemed to think of the strain which the work put on them. Referring to the strain on C.Os. of squadrons when waiting for suitable weather, he said he believed they scored over the enemy because waiting put more "ginger" into the subsequent attack. They would all remember the anxiety of those left behind while waiting to see the raiders come back, and the pride of the mechanics when their own machines returned bearing honourable scars.

The courage of the I.F. when real disaster befell was of the highest. Disaster, such as the loss of the greater part of a squadron, only made the survivors the keener to repeat the raid, and to turn disaster into victory. In this they scored over all other nations.

While the I.F. existed it dropped 553 tons of bombs in 230 day raids and 373 night raids. In addition to the original 8th Brigade it consisted of 104 Squadron (Major Quinnell), 97 Squadron (Major Albrecht), 215 Squadron (Major Fleming Jones), 115 Squadron (Major Garden), and 110 Squadron (Major Nicholl). They should also remember the good work of No. 3 A.S.D. under Lieut.-Col. Warwick Wright and later under Lieut.-Col. Collier.

As General Trenchard mentioned squadron by squadron the room rang with cheers, demonstrating convincingly that *esprit de corps* and squadron tradition is a very live force in the I.F., R.A.F.

The Effect of Bombing.

Continuing, Sir Hugh said that he had been asked for an opinion as to the relative value of day and night bombing. He believed that if they only bombed at night they lost half the value of night bombing and all the value of the day bombing. By bombing day and night the Hun was never allowed to be comfortable. Despite their own losses in bad weather they kept pressing on the Hun, and so they saved the lives of thousands of infantry—beside whose losses their own were very small indeed.

He had also been asked when was the right time to bomb Germany. Some of those present wanted to do it now. (A statement which produced loud applause.) He believed that the right moment came in the Spring of 1918, when the Hun was well held all along the line, before the Allied advance began. At that period that great R.A.F. force under General Salmond was bearing the whole weight of the Huns in the air. It was an extraordinary thing that the *moral* of the Air Force never went down even when they were beaten by sheer numbers.

General Trenchard acknowledged handsomely the help given to the I.F. by the various administrative services lent by the Army and the good done by the 8th Canadian Stationary Hospital under Colonel Munro.

He concluded this section of his remarks by paying a fitting tribute to those who had fallen. He said that the effort and example of those killed inspired the others to still greater efforts, and he asked those who remained that they should never forget to help the maimed and wounded.

He then proposed the toast of the R.A.F., coupling with it the name of General Newall, their able leader.

The Evidence of Experience.

Lieut.-Colonel Newall—late temporary Brigadier-General Commanding the 8th Brigade—who responded, said that his chief difficulty was to express what was in the minds of all present. General Trenchard had omitted to say what he did himself for the 8th Brigade.

(At this point the I.F. had its opportunity of expressing what it felt about General Trenchard, and it took many minutes to do it.)

It was a great thing for an officer commanding in the Field to know that he would be backed up. No force was ever better supported than they had been by General Trenchard, and this knowledge was the foundation of all the work of the 8th Brigade. He recalled how pleased they all were by General Trenchard's message on the signing of the Armistice. He expressed his profound admiration for the pilots and observers, and he proposed the health of General Trenchard.

An Outline of the Future.

After the toast had been duly honoured, and after the consequent effusion of enthusiasm had been quelled, General Trenchard proceeded to give the long-desired outline of the future of the R.A.F.

He said that it had been easy to command such a force as the I.F., but what was interesting them was the future. What he was going to say would be as unofficial as it could be, coming from him. Characteristically he told them that what he had to say would probably not please them, and then he proceeded to be as comforting as possible under the circumstances of a devastating peace.

He said that those who were working on the organisation of the peace-time R.A.F. had to build for the future, and not for the present (or for those present). He asked them to forgive the delay which had occurred and asked them to put their trust in the Powers that Be. Those Powers had the profession of the Service aviator at heart and desired that the R.A.F. should have as high a reputation in peace as in war.

They had formed a scheme and were going to stick to it in spite of criticism, and they expected and invited criticism. They intended to do as much for the rank and file as for the officers.

When the terms of service and pay were settled they could let them know more, but they did not expect to please everybody. Speaking from some years' knowledge of service aviation, he had never known two men to agree on any aeronautical subject, and no man liked other men's decisions.

The General Scheme.

Turning to the general scheme, General Trenchard said that the Air Force List would consist primarily of those holding Temporary Commissions. The holders of Permanent Commissions would be limited strictly to those who were assured of permanent careers and quick promotion in the R.A.F., for they could not have majors 70 years of age, nor people who were merely holding on for a pension.

Temporary Commissions would be granted for periods of two or four years, including training. There would be a gratuity at the rate of £75 per annum at the end of the period. When the period was finished the officer would go to the Reserve.

In addition a certain number of officers of the Navy and Army would be given Temporary Commissions in the R.A.F. and would be seconded from their own Service. They would bring their Services more closely in touch with the R.A.F., and on returning to their units they would spread knowledge of aeronautics. Thus closer co-operation between the Services would be obtained in time of war.

A Territorial Air Force.

General Trenchard said that there would also be a Territorial scheme. On this point he did not vouchsafe any information, but it is eminently satisfactory to know that such a scheme is under consideration, as it is a subject in which many ex-officers and men of the R.A.F. are keenly interested. It will be remembered by the regular readers of this paper that a Territorial scheme for the R.F.C. was strongly advocated long before the war, and that both during and since the war the desirability of a Territorial Air Force has been expressed.

An R.A.F. Sandhurst.

Looking still further into the future General Trenchard said that the underlying intention was that the Air Force of the future should be controlled by officers trained in the Air Force Colleges. This, be it noted, is a very important point, for it implies the formation of a species of R.A.F. Sandhurst and Woolwich, where the youth of the future may learn to become an officer and gentleman, as well as learning to be a pilot at an ordinary R.A.F. aerodrome.

General Trenchard also said, on this same subject, that he hoped some day to see a Chief of the Air Staff who would be an R.A.F. officer trained in an Air Force College.

Pay and Promotion.

On the immediately important subject of pay Sir Hugh said that, though he could not then state the rates of pay, it was definitely decided that they should be such as to allow an officer to live, and live well, on his pay.

Promotion would be rapid, so that a good man would have a chance of being a captain at 25 or 26 and a major at 30.

Present Commissions.

Appealing particularly to those present, he said that he hoped that those who were not chosen for permanent commissions would take temporary commissions, for at first only a few permanent commissions could be given. And it was hoped, when it was possible to decide the number of permanent commissions available, that there would be enough of them to give permanent commissions to some holders of temporary commissions. The ultimate size of the R.A.F. could not be decided till the Peace Conference had fixed the size of armaments.

Maintaining Service Traditions.

General Trenchard said that he hoped to keep R.A.F. units together and make them the homes of officers and men, just as the famous regiments of the Army were the homes of those belonging to them. He hoped also to see permanent stations at home with the same tone as that which prevailed among the squadrons in France. Further, he said that the great war squadrons would continue to exist, though the number could not be known till after the Peace Conference had finished its work. (These remarks were received with prolonged applause, which again gave evidence of the strength of a proper service tradition among the active-service people of the R.A.F.)

The whole scheme of the R.A.F. would be in the direction of economical use in peace and rapid expansion in war.

It was intended that those who held temporary com-

missions R.A.F. should be assisted, as much as possible, on leaving at the end of their period of service, to secure positions in civil life. (One assumes that the intention is to give them permanent jobs in the Civil Aviation Service, whenever that Service is properly established. This would be excellent, as a means of transmitting proper Service tradition into Civil Aviation.)

From Temporary to Permanent.

Continuing, Sir Hugh said that there would be a matter of four years of a transition period before cadets began to come through from the Air Force Colleges. Meantime, the second and subsequent batches of permanent commissions would be given to those holding temporary commissions.

Also some permanent commissions must be given to technical officers who had very just claim on account of their services.

Later on a few temporary officers would be elected each year by a specially chosen committee to become permanent officers.

It must in any case be two or three years before stability could be reached in the R.A.F., so there must be delay in deciding who was and who was not to have a permanent commission. He even hoped, if all were well, to bring back some of the good men who had left the Air Force.

He asked the R.A.F. to have a little faith in those who were reorganising the Air Force, and not to leave in haste.

He believed that in two years' time those who had left would be sorry they had gone. And it was his ambition that when they met again in two years' time they should drink his health with that same good feeling that they had shown that evening.

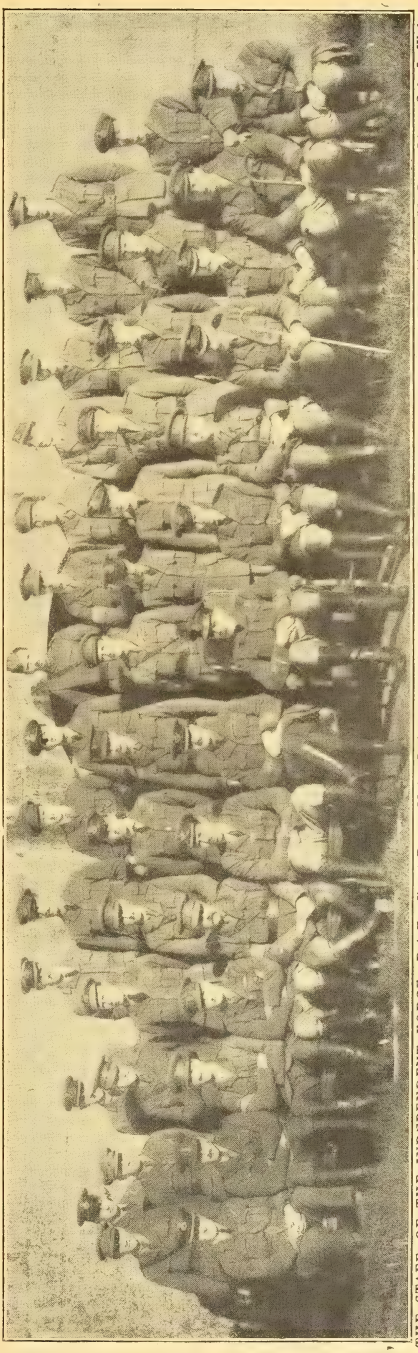
A Matter of Faith.

The response was such as to leave one in little doubt as to the faith in their Chief which was felt by those in the room. It is true that there were only a little over 100 of them, but they represented all ranks of officers in all squadrons, with the great majority very much of the junior ranks. And they may safely be taken as a very fair average of the R.A.F. as a whole.

There is no need for any doubt about the faith of the R.A.F., in its Chief, but there is grave doubt in the mind of the R.A.F. about the Government, and the Treasury, and above all about this fatuous idea of the League of Nations. One merely points out that there is no need to have faith in such things. The spirit of the Nation is stronger than Governments or Leagues, and the spirit of the Nation is formed by the inward grace and the outward signs of such as those who form the Royal Air Force.

One does not propose to discuss this subject further at the moment. One prefers to leave the statements of the Chief of the Air Staff as they are, without comment, and let them sink into the minds of the younger officers of the R.A.F.

At a later date one will return to some of the points mentioned. Meantime it would be interesting to have any ideas on these subjects which may occur to those who have served in the R.A.F. There is plenty of matter for discussion and suggestion, without destructive



THE STAFF OF THE INDEPENDENT FORCE, R.A.F.—*Front Row.*—Major J. A. Murray, Major F. G. Stammers, Major W. G. P. Young, Major H. W. M. Paul, Lieut.-Col. J. Waley Cohen, Lieut.-Col. A. V. Bettington, Brig.-Gen. E. B Gordon, Major-Gen. Sir H. M. Trenchard, Capt. H.R.H. Prince Albert, K.G., Col. Sir W. R. Lawrence, Bart., Major the Hon. M. Baring, Lieut.-Col. the Hon. V. A. F. W. Russell, Major J. W. Burt, Major T. V. Smith.
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criticism, but even destructive criticism is useful at times in its own way, and one will be glad to have it in any form.

None realises better than does the present writer how much the whole future of these islands depends on the Royal Air Force. One's greatest ambition is to see it not only the most efficient but the greatest of the King's Services, and to that end the remaining years of one's life are dedicated. And towards that end one bespeaks for the Powers that Be the faith and trust not only of those who still remain in the Royal Air Force, but of those who have left it but can still help it, and of those who, like oneself, can merely help in a humble civilian way from outside its gates.—C. G. G.

ON THE SUCCESS OF THE PIONEERS.

Congratulations to Captain Jack Alcock, D.S.C., and his navigator-assistant-pilot Lieutenant Arthur Whitten Brown on winning the *Daily Mail's* £10,000. If they could not have the distinction of being the first people in history to cross the Atlantic by air, they have, at any rate, the satisfaction of being the first to do a non-stop crossing, and the solid reward of what is, even in these days, a fairly considerable cash prize for their trouble.

One can only hope that His Majesty's Commissioners of Income Tax will refrain from levying toll on the prize on the grounds that it is part of the regular earnings of professional aviators. At any rate it cannot well be taxed at 5s. 9d. in the pound as "unearned income."

There is nobody in all aviation who better deserves to win the £10,000 than Jack Alcock, and nobody who was better fitted to win it by temperament, by training and by experience. He is one of the pioneers of British aviation, and he has served the King gallantly on active service, and those two facts give him a prescriptive right to the prize.

One's memory fails to record one's first meeting with Jack Alcock, but he was certainly among the very early inhabitants of Brooklands, if not actually one of the aborigines. One remembers him first as one of the assistants of Mr. Maurice Ducrocq, working on that funny little Henri Farman "racing" biplane which was originally (if one recollects rightly) the property of Mr. Snowden-Smith, now Lieut.-Col. A.S.C. and a bright star in Army Transport. At any rate it was from Mr. Ducrocq that he learned the art of tuning an aeroplane, and one remembers the respect in which he held the hawk-like eye of Mr. Ducrocq when it detected errors in the truing of cellules which even string and straight-edges failed to reveal.

Though he had been flying and working on aeroplanes for a long time, Jack Alcock only took his certificate at the end of 1912, his ticket being No. 368, dated 26/11/12. And it was taken (as a reward for good service) on that same old racing Farman, which, incidentally, passed into the R.N.A.S. at the outbreak of war and was crashed in 1915 by a clumsy pupil.

When Mr. Ducrocq ceased to spend his money on flying Jack Alcock was engaged by Mr. Louis Coatalen of the Sunbeam Co. to fly and maintain a Maurice Farman on which was mounted an experimental 150 h.p. Sunbeam engine which was the first Sunbeam used regularly on an aeroplane. On this job Jack Alcock's skill as an engineer, his diligence and perseverance, and his soundness as a pilot found full scope. With two or three assistants he kept that machine in perfect flying order. It was always ready for demonstration flights, and on it he put up some quite wonderful performances in the way of cross-country flights, especially in the "London-Manchester and Back" Race, and in one of the Aerial Derbys. He always knew exactly what the machine and engine would stand, and drove them just to the limits of safety, but never beyond. And he never "chucked stunts." His was always plain straightforward flying which inspired confidence.

Thus in those early days he did good service to aviation by demonstrating the safety and reliability of flying. And one knows that Mr. Coatalen will agree when one says that much of the reputation of the Sunbeam engine was built up on the results achieved by the skill and sound common sense with which Jack Alcock handled that early example.

A Fine War Record.

When war broke out Jack Alcock went and enlisted in the R.N.A.S., where he was put onto the job of instructing in flying. One forgets the rank with which he joined, but his earnestness and diligence and his imperturbable good temper, not less than his skill as a pilot and instructor, soon won him a commission. As a commissioned officer he continued to do instructional work at Eastchurch, where he developed, from being a school pilot of the slow and steady type, into a first-class scout pilot of quite unusual skill.

Thence he was sent out to the Mediterranean, where he served for some months before the first Handley Page, piloted by Lieut. McClelland and Capt. Savory, made its famous raid on Constantinople. When these officers returned to England their machine—very much second-hand—was turned over to Jack Alcock, who made several raids on it, including one of particular note on Adrianople.

Finally, while returning from a successful raid on Constantinople, one of the engines (the one which had been damaged in Lieut. McClennan's first raid) gave out, and after holding the machine aloft with one engine for many miles Jack Alcock was compelled to come down. With great skill he ditched the machine in the sea to the north of the Gallipoli Peninsula, hoping to be picked up by some of our patrol boats. But, as in other instances, the British Navy was not to be found where it might have been expected, so ultimately the H.P. crew were rescued by the Turks, who treated them as well as their own poor circumstances allowed, and sent them to Constantinople.

The rest of the war Jack Alcock spent in a prison camp, but beyond being somewhat bored by inactivity he never lost his cheerful spirit, nor his interest in flying. In the very first letter which one had from him after his capture he said: "Tell Coatalen I shall be ready for any big stunt after the war." And one is delighted to see that he has pulled off the biggest contemporary "stunt" open to any aviator—albeit not with the aid of his old friend and employer, Mr. Coatalen.

A Combination of Pioneers.

As soon as he returned from captivity Jack Alcock set about searching for an opportunity to do something big. It was not that he wanted to advertise himself, or to become a popular hero—for he is, and always has been, one of the quietly confident sort who does much and talks little—but that he wanted to do that "big stunt" of which he wrote. He found his opportunity



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with the Vickers people, among his old friends at Brooklands. Mr. Muller—a hard-headed Scot, a Miller by descent for all his Germanised name—had been a fellow-worker with Jack Alcock in the Ducrocq days, and had joined the Vickers works at Dartford. His ability was recognised by the late Major Wood, and he together with Mr. Archibald Knight (certificate No. 60, dated 14/2/11)—one of the first of the Vickers crew at Brooklands, and still earlier of the Bristol Co.—were appointed to organise the new Vickers works out of what had been the Itala works just outside the Brooklands track.

This proved to be the most successful of all the Vickers aircraft ventures and achieved record outputs during the war. Mr. Peirson, the chief designer of the Vickers firm, under the instructions of Major Wood, designed the Vickers "Vimy" bomber somewhere about the end of 1917, and the machine when produced proved to be one of the best of all twin-engined aeroplanes. The late Major Gordon Bell, who flew the experimental machines, was enthusiastic over its maniability and its all-round performance.

When, after the usual Air Ministry delays and muddles, it was put into quantity production about a year after it was designed, the Vickers Weybridge works were turned onto the job of manufacturing it. Thus it came about that when Jack Alcock went down to pay a visit to his old friends Muller and Knight he found the instrument for his big stunt ready and waiting for him.

Captain P. D. Acland, who had been Major Wood's Chief of Staff at G.H.Q., Vickers, Ltd., for some years —after being invalided from active service—and who succeeded Major Wood so ably as head of the Vickers Aviation Dept., at once recognised in Jack Alcock the right man for the trans-Atlantic attempt. Colonel Caddell, O.C., Vickers' Civil Aviation ventures, concurred cordially. And so Jack Alcock got the job.

Thus for once Fate has been kind to the deserving, and those pioneers of the old Brooklands days, Jack Alcock, Percy Muller, and Archibald Knight, have met with deserved success, for they have pulled off the biggest prize open to them at the time when they made their effort. None could have succeeded without the others, so to all of them the credit is due.

One ought perhaps to include in the congratulations Mr. Royce, of Rolls-Royce, Ltd., who, although not a pioneer of aviation, is certainly a pioneer of motor making. His ruthless policy of testing and scrapping, testing and scrapping, has produced certainly one of the most reliable engines in the world. And without that quality of reliability the trans-Atlantic journey could not have been done. To him also one offers congratulations on his success.

Further, one would like to congratulate the Vickers firm on this great success, after years of hard work and consistent bad luck. One regrets deeply that that good little sportsman, Major Bertie Wood, did not live to see the success of the machine which he fostered so carefully. But one rejoices that an equally good sportsman, Captain Acland, had a hand in the affair.

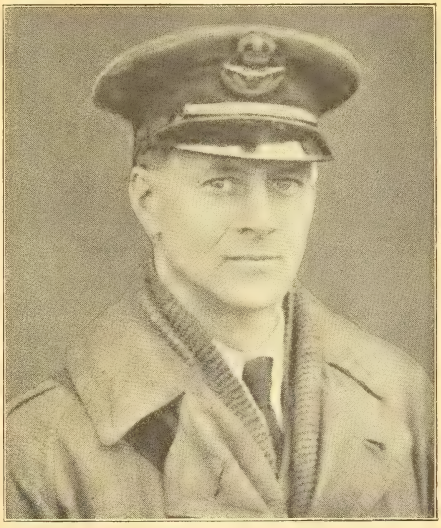
Jack Alcock's career has been recorded in some detail, but, knowing his modesty, one will refrain from comment on his personality, beyond saying that he is a big, hefty fellow of the sort who would be a comforting companion in a street or music-hall row, that he is quite passably good-looking, and that he possesses a most undefeatable good temper. He hails from the North—one believes from Manchester in particular —so here, at any rate, is another excuse for the existence of that part of England. The way in which he appears to those who know him is best summed up in the phrase of another aviator, who remarked simply, "I'm glad old Jack has got it. He's such a damned good chap."

The Navigator.

One has not the pleasure of knowing Lieutenant Arthur Whitten Brown intimately, but the fact that the Vimy met the Irish coast at Clifden, a projecting point of Ireland which might easily have been missed, shows him to be a navigator of considerable ability. It is to be hoped that he will relate his experiences and will demonstrate his methods to the Royal Aeronautical



Capt. J. ALCOCK, D.S.C.



Lieut. A. W. BROWN.

Society, as one gathers Lieut.-Commander Grieve is to do.

Judging by the newspaper stories Mr. Brown would also appear to be a humorist of no mean order, for it is reported that he told some inquiring—or perhaps one might say inquisitive—person at Clifden that at times the Vimy was upside down 10 feet from the surface of the Atlantic. How, under the circumstances, a machine 67 feet in span and 40 in length succeeded in coming right side up again, even in the hands of Jack Alcock, passeth human understanding, but apparently does not defeat the gullibility of the newspaper reporter and editor.

For the sake of getting away with this yarn, if for no other reason, Mr. Brown deserves to be received with open arms into the innermost brotherhood of the Royal Aero Club. And even if he did not do it on purpose, he deserves credit for whatever the original story may have been from which the Press distorted it. Quite apart from that, one gathers that he has been an R.F.C. pilot with flying on active service to his credit, and anyhow he is a friend of Jack Alcock's, and those are good enough credentials for anybody.

The daily news-sheets emphasise the fact that he is about to be married. One wishes him as good fortune in his new partnership as befell him in his trans-Atlantic effort.

The papers also state that, though he was born in England, his parents are American citizens. Therefore one supposes one ought in this case also to thank the United States for showing the English the way across.

Further Attempts.

We have been told *ad nauseum* by journals of all descriptions that the attempt to cross the Atlantic in a non-stop flight demonstrates the finest qualities of the British Race. So it does. But, now that these excellent qualities, which include that invincible optimism and that marvellous disregard of logical sense which won the war for us but are precious little use in business have been demonstrated, perhaps one may ask what is the use of future attempts?

So far as one can see they can be of no use whatever. We are no nearer to a regular trans-Atlantic air service to-day than we should have been if the Atlantic had not been flown at all. Further attempts to fly across cannot be of any value to commercial aeronautics nor to civil aerial transport. They merely involve needless risk of valuable lives, and of machines representing money which will be badly needed in the Aircraft Industry in future.

If any other machines get across they win no prize, and they do not prove anything that is not known already. If the owners of those machines want to prove something, and want to demonstrate the commercial value of aviation, the best thing they can do is to send them off on a non-stop flight from Newfoundland to New York, or to Toronto, and then keep them in America, demonstrating to the United States and Canada the real possibilities of aerial transport.

What is Commercial Flying?

One of the pioneers of aviation, and one of the best business men in the Aircraft Industry, was asked the other day to define Commercial Aeronautics. His reply was simply: "Any flying that pays is Commercial Aeronautics, any other isn't." That sounds like a platitude, but in essence it is an epigram. Flying the Atlantic at present is not going to put a penny into anybody's pocket, and it is going to cost a lot of money. Demonstrating British machines in both the American Continents can be made to pay its own way on the spot, and will bring further business. One is Commercial Aeronautics and the other is not.

Flying in the Aerial Derby next Saturday is a commercial proposition because the successful machines will demonstrate their qualities at small risk and expense, and the makers advertise them in this way with reasonable prospects of getting orders for others like them. But nobody is going to buy a trans-Atlantic machine for fun, and Governments who want machines of more or less similar types do not require a trans-Atlantic flight by way of an acceptance test. Therefore trans-Atlantic flying is not Commercial Flying. Nor is it sporting flying, for the prize offered has now been won. It is simple foolhardiness.

Therefore one hopes that those firms whose machines are in or on the way to Newfoundland will devote the aeroplanes and their crews to some purpose which is more likely to bring business to the Aircraft Industry. In this way they will do more to help forward progress in aviation.—C. G. G.

A WELL-EARNED HONOUR.

All officers and men of the early R.F.C. and all those of the R.A.F. who have served in the East will rejoice at the well-earned honour conferred on Major-General W. G. H. Salmond, C.B., D.S.O. (R.A.), whose appointment to be K.C.M.G. was recorded in the "Gazette" of June 3rd. Unfortunately, the date on which the "Gazette" appeared has prevented any earlier reference to the appointment.

After doing distinguished service with the R.F.C. in France in the early days of the war, Major Salmond (as he then was) was appointed to command the first R.F.C. units in Egypt, at the time when the Turks were making their attacks on the Suez Canal. When the R.F.C. units in the Near East grew into a Brigade, General Salmond was appointed to command, and took over not only the Forces in Egypt and Palestine, but those in the Balkans as well.

Later, again, the R.F.C. Middle-East detachments in Mesopotamia and in India came under his command, and he was promoted to Major-General.

Huge permanent workshops were set up in Egypt, and an immense training school came into operation there during 1917. Thus the whole of the training arrangements, as well as the active service operations in all Eastern areas came under General Salmond. The success of the R.F.C. in all these areas under the most difficult circumstances gives the best possible testimony of General Salmond's remarkable all-round ability.

When the R.A.F. came into being on the fatal April 1st, 1918, the R.N.A.S. units in all the Eastern war areas also came under General Salmond's command, and those who have been at all closely in touch with these units cannot fail to have been impressed by the appreciation expressed by all ranks of the way in which General Salmond has dealt with them, again despite remarkable difficulties as regards the supply of matériel.

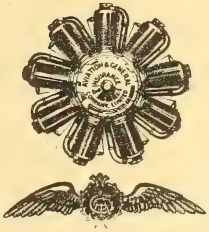
One has referred to the difficulties under which General Salmond has worked, and lest one should be suspected of expressing a merely personal opinion, one would quote in proof of one's own statement the following passages from a vivid article in the June number of "Blackwood's Magazine" by Captain Alan Bott, M.C., who served in Palestine during 1918:—

"Up till the last few weeks of 1917 the Flying Corps in Palestine had, frankly, a difficult time. This was by no manner of means the fault of the pilots, nor of the R.F.C. Staff on the spot. It was an inevitable result of the policy of gentlemen in England who were giving the Eastern Fronts certain types of machines which seemed specially designed to give their crews a minimum chance of defending themselves—types which had to be dumped somewhere, because other gentlemen in England had ordered them in hundreds and thousands long after they should have been obsolete as regards active service.

"Thus, apart from a few Beardmore-Martinsydes—excellent as light bombers, but never much good as fighting craft, even when they were first used on the French Front in 1916—the only British aircraft in Palestine prior to the last few weeks of 1917 were the much too 'inherently stable' B.E. brands, officially designed, officially promoted, officially ordered by the thousand, while better privately-designed types were ordered by the score, and officially foisted on oversea squadrons, so that they became the unofficial bugbear of active service pilots. And the German fighting pilots in Palestine, particularly one Oberleutnant Felmy, with their Albatros single-seaters, enjoyed themselves immensely—for a while.

"With the arrival of a few Nieuports on the British side they enjoyed themselves rather less, and when some Bristol Fighters, and, later still, some S.E.5s, flew into the arena, the Air Boche, Palestine species, had a perfectly beastly time. The R.F.C. Brigadier-General used his reinforcements to the best advantage, and after one or two special exploits (like that of Capt. Peter

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Drummond, D.S.O., M.C., who, on a Bristol Fighter, destroyed three German machines over their own aerodrome within 10 minutes of attacking them), we seldom found any black-crossed craft over our part of the lines."

Further on, writing about the opinion of a captured German aviator, Capt. Bott says:—

"His opinions on our airmen and machines were interesting. Our pilots were splendid, but too reckless, he thought. As for the machines, the Bristol Fighter was the work of the devil, and to be avoided at all costs; the R.E.8 might safely be attacked unless it were well protected, the British single-seaters were good, but the German Flying Corps regarded the B.E. types as 'sehr komisch.' Later, when I was myself a prisoner, I found these statements echoed by other German pilots."

These sentences, better than any of one's own, will give an idea of the difficulties against which Sir William Salmond has had to contend.

As in the West, under Sir Hugh Trenchard and Sir John Salmond (the younger brother of Sir William Salmond), the R.F.C. people in the East have always been full of admiration of their G.O.C., and the loyalty which Sir William Salmond inspires in those who serve under him in all ranks is proved by the frequency with which one hears it said by the people from the East that if only their General had been in France instead of being buried in the East, he would certainly have been G.O.C., R.A.F., on the West Front.

One may perhaps hazard a guess that Sir William Salmond's success is due to his talent for recognising a good man when he finds him, putting him into the right job, and then leaving him alone to do the job in his own way. And equally the loyalty which he inspires in those under him may be ascribed to everybody's faith in his absolute fairness and freedom from personal bias or prejudice, and his firmness in supporting his subordinates.

The R.F.C. throughout the war has been singularly fortunate in its senior officers in the war areas (unlike the R.N.A.S.), and in no war area has it been more fortunate than in the East. All who have served with him will join in congratulating Sir William Salmond on his well-won title.

THE AIR MINISTRY AND CIVIL AVIATION.

On Thursday last the following letter was sent from this office to each of seven leading London papers which profess to take a lively interest in the progress of aeronautics:—

People who are interested in the development of Civil Aviation will regret to learn that owing to an extraordinarily short-sighted action on the part of the Air Ministry, the British Aircraft Industry is to be deprived of its first opportunity of demonstrating its superiority over the Industries of other Nations.

As is pretty well known, the Circuit of London Race, commonly known as the "Aerial Derby," is to be flown at Hendon on Saturday, June 21st. A number of firms have entered their very fastest machines for this race, and as so much interest is being taken in the race by everybody, and as it is certain to receive an enormous amount of attention in the Press, naturally the machines which put up good performances would, in the ordinary course of events, receive an excellent advertisement all over the world, which would not merely be for the good of the particular firms concerned, but would ultimately react on the whole British Aircraft Industry, and so on the reconstruction of British Industry in general.

One now learns that the Air Ministry has forbidden the Aircraft Industry to use in that race any machines or engines which are either the actual property of the Government, or have been built to the order of the Government but not delivered. This order will bar from the race the Sopwith 'Dragon" (A.B.C. engine), the Martinsyde "F.4" (Hispano-Suiza engine), the B.A.T. "Basilisk" (A.B.C. engine), and any other of the very high-speed machines fitted with A.B.C., Cosmos, Hispano, or Rolls-Royce engines which happen to have been allocated to the firms in question to be fitted into machines ordered by the Government.

I venture to submit through your columns that this action on the part of the Air Ministry is exceedingly detrimental to British Industry as a whole. None of these machines is wanted in a hurry for military purposes, and, from what one knows of Air Ministry methods, if they were all delivered to-morrow they would either be crashed the next day, or else would be kept hanging around for weeks without ever being used. Therefore, it cannot matter to the Air Ministry whether they have to wait for delivery until the Monday following the "Aerial Derby" or whether they have to wait for completely new machines to be built if the whole lot are crashed in the course of the race.

On the other hand, the performances of the machines in the race would be an excellent indication to the Air Ministry itself of the relative values of the machines.

May I suggest that your readers will be interested in this example of our official method of helping British Industry.

(Signed) C. G. Grey, Editor, The Aeroplane.

One has only been able to trace one reference to the subject in any newspaper—the "Daily News" to wit. Therefore, readers of The Aeroplane may form their own judgment as to the amount of real interest which the Press takes in flying, whether from the point of view of sport or commerce.

It would seem, furthermore, that the Press is equally blind to its own interests, for if the barred machines had put up particularly brilliant performances they would have afforded our journalists an opportunity for letting loose their most fulsome superlatives, and if one or more of these very fast machines had crashed still greater opportunities would have been offered to the Press in that the hack writers could have revelled in horrible details.

The list of machines affected by this dog-in-the-manger policy are:—An Armstrong-Whitworth machine (details unknown); a Bristol, with a Cosmos engine; a Vickers machine (details unknown); a new Sopwith, with "Dragon-Fly" engine; a Nieuport "Nighthawk," with "Dragon-Fly" engine; one of the F.4 Martinsydes, with Rolls-Royce engine; an Airco D.H.10 (twin-engined); a B.A.T. "Basilisk" ("Dragon-Fly" engine); a Boulton and Paul "Bourges" (twin A.B.C. engines).

And there may be others of which one has not actual knowledge.

This, then, is the Air Ministry's idea of encouraging aviation, after all the talk that we have had from General Seely and General Sykes about their earnest intention to assist Civil aviation in every possible way.

Although the list of machines which have been entered in spite of the Air Ministry's best endeavour to spoil sport will undoubtedly provide a very fine race, the result cannot be taken as actually representing in any way the genuine progress of British aviation. Until the various assorted controls exercised over Civil aviation by the Air Ministry are themselves adequately controlled we cannot hope to get a really representative exposition of what the British Aircraft Industry can do.

C. G. G.

AIR MINISTRY ASSISTANCE.

The following letter has been received:—

Sir,—Encouraged by the publicity given to my letter in the "Times," Monday, 9th inst., in your paper, on the subject of Civilian Flying, I wish through your columns to ask the Air Ministry a question.

Is Civilian Flying being assisted, subsidised, or taxed? My answer is that it is not being assisted, that it is certainly not being subsidised, and that it is being very heavily taxed. In proof of this I paid last week to the Government £80 for housing and landing fees of eight machines, on the average. Assuming the normal civilian accommodation of Hounslow Aerodrome to admit of 48 machines, this would produce a weekly revenue to the Government of £480, and an annual revenue of £25,000.

This charge of £80 is made to me without any of the assistance which is provided for in the way of labour under the Air Navigation Acts, as I provide my own personnel entirely.

In addition to this no spectators are allowed into the Aerodrome, as the Air Ministry have informed me verbally that they do not want them.

Thirdly, no exhibition flying is allowed within 2,000 yards of the aerodrome, and both I and my pilots have frequently been warned for alleged infringement of this regulation.

Most of the extravagant charges and strict regulations are justified by the Air Ministry on the ground that Hounslow is *the* London terminus, and that the dignity of the Station as *such* requires support. My flying has also been termed "not serious" by a member of the Staff of the Controller-General of Civilian Aviation.

All these things, besides many others, incline me to the view that civilian aviators are at present looked upon as a nuisance and treated as dangerous. As an ex-officer and ex-Wing Commander, Royal Air Force, I naturally feel the imputation very strongly.

You are at liberty to verify my figures from the accounts which are presented to me weekly.

One other point to assist my argument—I am still being charged for petrol to include the 6d. tax which was removed by the Treasury as from June 1st. One more indication of the value of this "assistance." G. L. P. Henderson, Lieut. Col.

AERODROMES FOR SALE.

The Disposal Board of the Ministry of Munitions are including several aerodromes that are not required for Government purposes in the present sale of Government property. Of these, two are situated at Goldhanger and Stowmarket in Essex, two in Suffolk at Burgh Castle and Covehithe, one at Lilbourne on the borders of Northants and Warwickshire, and the others are at Ramsey (Hunts), Telscombe (Sussex), and Edzell (Kincardine).

In some cases the buildings, with the land on which they stand, might be required without the aerodromes, as suitable for factories, hospitals, convalescent homes, training centres, etc. The various buildings are of brick, corrugated iron, and timber, with water supply and electric light, and could readily be adapted for any of the purposes mentioned. There are also permanent roads.

Intending purchasers can obtain further particulars by applying to the Disposal Board, D.B.I.a.3, Room 135, Charing Cross Buildings, Villiers Street, W.C.2.

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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

Subterranean Flying.

The following official communiqué has been received from the U.S.A. War Department News Bureau :—

"Ellington's 'Gulf to Pacific' squadron of De Havilland Fours has returned home after a remarkable cross-country flight of 3,300 miles. This squadron, under command of 1st Lieut. R. O. Searle, has charted unknown territory, has skimmed the waters of the Gulf of Mexico, has darted over the backbone of the continent at a height of 16,000 feet, has tasted salt water at San Diego, and has even flown 600 feet underground."

One wonders if it was after "tasting salt water" at San Diego that the pilots flew 600 feet underground, or if they were trying the experiment of boring for oil with aeroplanes.

At the end of the communiqué, however, one finds the following :

"Lieut. Rugh and Mr. Lewyn, the motion-picture man, actually flew down into the canyon. They got down to 600 feet below the edge of the canyon."

Life is full of these disappointments.

The History of the R.N.A.S.

The proposal by a correspondent for a history of the R.N.A.S. is excellent so far as it goes, but where would it finish? Surely not at the birth of the Royal Air Force, because the R.N.A.S. preserved its identity long after that unhappy event. The final effort to break the *esprit de corps* of the Naval Service was the order forbidding the use of the White Ensign. The peculiar significance attached to the flag cannot be expressed in words, or understood by those who have not served in the senior Service, but the order caused great resentment, and was flatly ignored at some Stations.

The Altiplane.

The following are the salient points in an address by Samuel D. Mott, an Edison pioneer, to the Pan-American Aeronautic Convention on the lessons of the Atlantic flight :—

"We have read of many men tarrying at Newfoundland for several weeks waiting—waiting for the weather," he said. "That trial was a glorious undertaking, our Navy's expedient was wise, and all honour to the brave men attempting the test. But I submit that waiting indefinitely for ideal weather conditions for long-distance flying over land or sea will not do for the demands of commerce. Therefore, I would bring to your attention the possibilities of the antithesis of the submarine—the altitude plane, or altiplane, as distinguished from the airplane or hydroplane, to go into the stillness of nature above the weather.

"The problem is evidently one of equipment of our planes to function in rarified air and protection of navigators against its tenuity, likewise protection of their body warmth and comfort in extremes of temperature. I believe it possible to go 15 or 20 miles aloft. It is obviously a matter of equipment plus climbing ability of aircraft designed for the purpose.

"When we double the time to do a risky thing we double the risk incurred. Less gasoline, less weight and expense, for if environment permits to go 100 miles with twice the fuel we formerly used to go 25 miles our economic gain is obviously 100 per cent., because we may then go 100 miles with the amount of fuel we formerly consumed to go 50 miles."

The last paragraph strikes one as being somewhat involved. For example, what does Mr. Mott mean by "when we double the time to do a risky thing we double the risk incurred"? If he refers to *any* risky thing, then it would be safer for a soldier after going over the top to stroll quietly towards the enemy than to
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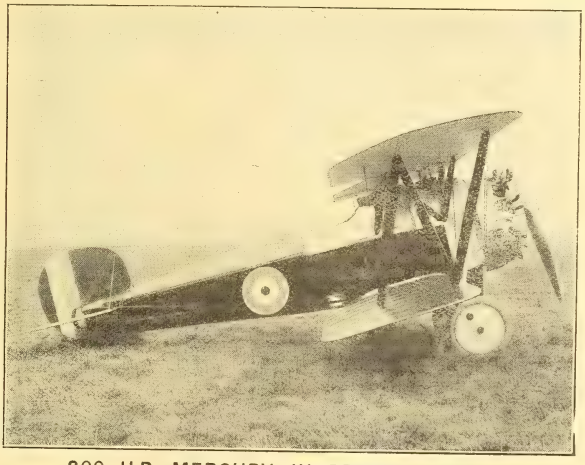
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10,000 FEET IN 5 MINUTES 25 SECONDS

AT FARNBOROUGH IN APRIL, 1919, A BRISTOL SCOUT FITTED WITH A "**MERCURY**" ENGINE CLIMBED 10,000 FEET IN 5 MINS. 25 SECS., & 20,000 FEET IN 16 MINS. 15 SECS., SPEED AT 10,000 FEET 143 M.P.H. OFFICIAL CORRECTED BAROGRAPH FIGURES.

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LUCIFER	100 H.P.	WEIGHT 220 LBS.

CONTRACTORS TO THE AIR MINISTRY

The WORLD of AERONAUTICS (continued)

On that Matter of Hospitality.

One hopes that certain notes in this paper last week on the apparent lack of courtesy which the crews of the American N.C. Flying-boats received in this country will not be taken by our relatives across the Atlantic as indicating that the Authorities of the various aeronautical associations in this country were guilty of any intentional discourtesy.

The lack of hospitality merely indicates that the Englishman collectively retains his Teutonic boorishness, despite the fact that the English gentleman individually is the finest example of his class in the world. In support of this statement it is worth while to re-tell two stories told by an aviator recently returned from "foreign parts," to wit a neutral country.

According to the first story a great ceremony was organised at the British Embassy in the capital of a certain neutral Nation at which ceremony sundry British decorations were to be presented to certain officers of that country who had done very distinguished service in a strictly neutral capacity for the benefit of our wounded and sick soldiers.

A wonderful programme was arranged, according to which the British Ambassador was to make a speech and the band was to play the British National Anthem; then the chief notability of that particular neutral country was to make a speech and the band was to play his National Anthem; then the senior officer who was to receive a decoration was to be presented, and after he had made his speech the band was to play an appropriate air, and so forth all down the list. Everything was beautifully arranged and the noble company was duly assembled.

The Ambassador and the leading notability made their speeches, the National Anthems were played. And only then was it discovered that the officials of the Embassy had entirely forgotten to invite the officers on whom the decorations were to be conferred.

Unfortunately what happened afterwards is wropped in mystery. Presumably, swift runners were sent into the highways and byways to compel the recipients of the decorations to come in.

The other story also concerns a British Embassy in a neutral country. In this case a great function had been arranged to which all the Military, Naval and Society leaders of the neutral capital were invited to the British Embassy to meet a number of British aviators who had arrived by air in that country. The function was a great success. Everybody wore his or her most brilliant clothes; the music, the food and the drink were of the best; and all concerned enjoyed themselves thoroughly—except the British aviators, who did not hear about the function until the following day.

Nevertheless, they had actually enjoyed themselves very much, because they had spent the evening at a private dinner and dance given by certain personal friends of their own in that neutral capital.

Thus, it may be seen that the official Englishman even carries his curious notions of hospitality, and incidentally of organisation, abroad with him.—C. G. G.

No. 1 R.A.F. Cadet Wing Dinner Club.

A dinner will be held at the Café Royal on June 25th at 7.30 p.m. Officers wishing to attend are requested to communicate at once with Mr. L. Banister, 5, Argyle-Mansions, W. 14.

The Truth Revealed.

The following appeared in the "Daily Mail" on June 13th:—

"The compulsory fitting of life-saving parachutes to all Royal Air Force aeroplanes has been agreed to by the Government, and an instruction to this effect will shortly be issued by the Air Council.

"Whether this order will be applied also to British commercial aircraft is not yet decided; but it is probable that training machines at least will be compelled to carry some form of life-saving appliance.

"Ever since the 'Daily Mail' pointed out the urgent necessity of fitting our fighting aircraft with 'aerial lifeboats'—and demonstrated their practicability by successfully delivering newspapers by air by means of 'Guardian Angel' parachutes, the authorities have had the matter under consideration and the most extensive experiments have been carried out."

It is interesting to note that it was the "Daily Mail" that demonstrated the practicability of the "Guardian Angel" parachute to the authorities. One had an idea that the Air Ministry had heard vague rumours of the existence of this "aerial lifeboat" before the "Daily Mail" used it for delivering its newspapers.

Flying at Hendon, 1919.

The following letter has been received:—

Sir,—After reading your article entitled "Flying at Hendon, 1919," one feels distinctly pleased at the suggestion put forward concerning the buying up of old Service machines and letting them out to "demobbed" R.A.F. pilots at a nominal fee, for use on Saturdays and Sundays.

I am an old pilot, having taken my certificate in 1915, and would very much like to "keep my hand in" in this way.

One reads of the scandalous burnings of "demobbed" Service machines, and yet when one tries to purchase one, the price quoted is beyond even an ex-R.A.F. officer, these days.

I hope, and I think I am not only speaking for myself, that your suggestion will be pushed forward again.

Alan H. Curtis (Capt., late R.A.F.).

De-assembling and Dissembling.

Colonel M. O. Darby, R.A.F., Assistant Controller of the Aircraft Disposal Department, recently told a representative of the "Daily Mail" that "the only cases of de-assembling of new machines refer to certain types of aircraft, now obsolete, which were designed solely for fighting. They were dangerous in the hands of the most experienced pilots. Many refused to fly them, and the machines have since been replaced on the active list by later and more efficient types. The Air Ministry has forbidden the sale of the dangerous machines.

"They have, therefore, been scientifically dismantled. Every instrument and part is accounted for and either stored or sold. Obsolete metal fittings are melted down. Even the dope is extracted from the fabric, and the canvas itself is sold for making bank-notes. These parts are yielding a big return, and batches of obsolete engines, which have done considerable service, have been sold for what the Government paid for them."

One wonders if it was the "canvas" that made these machines dangerous. Bank-notes made from the canvas of dangerous machines ought to be issued at a premium as curiosities.


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The WORLD of AERONAUTICS (continued)

The International Air Code.

Reuter reports that:—"The Aeronautical Commission of the Peace Conference has completed the drafting of an Air Code in the form of an International Convention for Aerial Navigation. It has now been submitted to the Allied Governments for signature."

Aerial Hearses.

According to the "Daily Mail," Messrs. Handley Page have just received a request for aerial hearses. An undertaker with imagination conceived the possibility of a person dying in London having expressed a wish to be buried in Scotland, and of making the funeral journey by air instead of by rail. The firm, however, have replied that they have no intention, at present, of doing business of this kind.

Another rather grim proposition is that for an aerial service in India to carry sick and dying Hindus to the sacred waters of the Ganges.

The Value of Speed.

On June 14th, Mrs. Leon Errol, a lady who wished to go to America, lost the boat-train at Waterloo. The "Aquitania" was to sail in a few hours, and no other train would arrive at Southampton in time.

She was driven to Hounslow, where she changed into an aeroplane, and flew to Hamble, Southampton, where another car enabled her to catch the boat.

The Aircraft Exhibition at Amsterdam.

Further particulars of the forthcoming aircraft exhibition at Amsterdam have been published. On June 11th the "Morning Post" stated that the Overseas Department of the Board of Trade are giving their assistance and affording what facilities they can, though they are sadly hampered by the limited funds placed at their disposal by the Treasury. The Air Ministry are also giving their support.

The exhibition buildings are to be on ground within a short distance of the central station in Amsterdam. They will occupy a square quarter of a mile. An amusement park is to be attached. There is a flying ground slightly over a square mile in extent, and there are plenty of water areas for seaplanes.

The Dutch are eager to establish flying services not only at home, but in their colonies, the Administrations of the latter having already sent Commissions to promote inter-colonial aerial routes, and study the various types of machines. Flying demonstrations will be a feature of the exhibition.

About 60 per cent. of the space allotted to Great Britain has been taken up. The largest exhibit will be that from Messrs. Vickers,, which will occupy 430 metres. This firm has secured the central area in the British section. There will be a big Marconi installation. Other firms taking part are the Aircraft Manufacturing Company, the Handley Page Company, the Blackburn Aeroplane Company, the Cosmos Engineering Company, the British Aerial Transport Company, Beardmore and Co., the Siebe Gorman Company, the Gosport Aircraft Manufacturing Company, and the hangar building firm, Albion, Richards, and Co.

In all there will be 15 groups, including an historical one, the others being for aeroplanes, hydroplanes, motors, motor-cars, and motor-cycles, tools, photography from the air, map making, wireless telegraphy and telephony, instruments, meteorology, etc.

A regular flying service with other countries will, if possible, be inaugurated, and there will be a series of lectures.

A Sequel to an Aeroplane Smash.

Leonard Edgar Minns, a youth living at Monkshaven, Great Nelmes, Hornchurch, was summoned at Stratford, on Saturday, for having in his possession an aeroplane compass.

Mr. Harold Pearce, prosecuting for the Director of Public Prosecutions, said that on May 15th, at about eleven o'clock in the morning, an aeroplane went up at Hornchurch, and unfortunately it crashed down at Bull-street, Dagenham. The pilot was killed, and a very large crowd immediately gathered. Whilst the pilot was being removed from the wreckage the defendant was seen to take the compass from the machine, place it in his haversack, and then cycle away. He was, however, followed, and the compass—which was bespattered with the dead aviator's blood—was taken away from him. Mr. Pearce added that one would have thought that such a tragedy would have deterred souvenir-hunters, but the peculiar thing in connection with accidents of that kind was that people frequently stole various parts of the machine. On one occasion important dispatches were stolen, and the thief could not be traced.

The defendant admitted that he took the compass but said that he had no idea that he was stealing.

Mr. Eliot Howard (the chairman) said these thefts were very mean indeed, and might at times mean that the cause of a serious accident could not be fathomed. A fine of £5 would be imposed.

Entertainments for the Atlantic Fliers.

It is understood that on Friday, June 20th, the "Daily Mail" will entertain Capt. J. Alcock and Lieut. A. Whitten Brown at a luncheon at the Savoy Hotel, when the prize of £10,000 will be awarded.

On Monday, 23rd, a banquet at the Savoy will be given in honour of the aviators by the Royal Aero Club. Members are requested to apply for tickets to the Secretary of the Royal Aero Club.

No. 4 Squadron's Dinner.

A reunion dinner of No. 4 Squadron, R.A.F., will be held at an early date. Major-General C. A. H. Longcraft, C.M.G., D.S.O., A.F.C., will be present as guest of honour. Any officer, past or present, wishing to attend should communicate with Mr. F. W. Rennie or Mr. Douglas Welch, R.A.F. Club, Bruton Street, enclosing £2 2s. cheque.

Meteorological Information.

Requests for information regarding weather conditions in connection with flights in various parts of the United Kingdom are frequently received by the Air Ministry. For the present it is necessary that such inquiries should be made three to four hours before the information is required. They should be addressed to:—Controller-General of Civil Aviation, Controller of Meteorology, 5, John Street, Adelphi, W.C.2. Telephone: Regent 8,000. Extensions, 1672, 1673, or 1674.

An Accident.

While flying with two passengers at Southport on June 10th, a Sopwith three-seater aeroplane crashed on the sands and turned over, immediately afterwards bursting into flames. The pilot, Capt. Barnard, was badly burnt, one of the passengers, Lieut. Sempele, suffered slight injuries, and the other escaped unhurt. The machine had made a trip to and from Blackpool.

A Volunteer Air Force Reserve.

The following letters have been received:—

Sir,—As a reader of THE AEROPLANE, and an ex-pilot, I entirely endorse the remarks of Mr. Collins and others as to the desirability of forming a Volunteer Reserve Air Force.

The only way by which pilots can retain their efficiency is by practice; this, of course, applies to everything, but especially with regard to flying.

There is no doubt at all that a very large number of ex-pilots and observers would willingly give a considerable amount of their spare time for training, and it seems an awful pity that the results of so much money expended on each individual's training should be wasted, as, indeed, it will be, if some scheme is not formed.

I should consider a scheme whereby pilots could fly an hour or so a week a very favourable solution; this might be done either during the week-ends, or in summer time during the long summer evenings. Each pilot would be detailed to the R.A.F. aerodrome nearest his home—not furthest away as might happen if this were not emphasised.

There would, of course, be difficulties as to mechanics working on Saturdays and Sundays, but the difficulties could easily be overcome.

I am sure it is the earnest desire of many ex-R.A.F. pilots that a scheme of some sort should be formulated. I hope the Government in an effort to save money will not do so to the detriment of the country's future aerial efficiency.

R. J. MORTON.

Sir,—Respecting the invitation, which appeared in THE AEROPLANE some weeks ago, to air one's views respecting the formation of a Volunteer Air Force, I think that the scheme is an excellent one, and I, for one, would willingly join.

To the many hundreds of R.A.F. officers who have been demobilised, the many new types of aeroplanes, engines, methods of warfare, etc., that may be introduced would be more or less unknown; and it will only be by having some form of Volunteer Air Force, similar to the old Territorials, in which a certain amount of time per year be devoted to training under service conditions, that the already fully trained pilots, technical officers, etc., whose services the country should not ignore, can "keep their hand in" on the latest machines or become familiar with the *dernier cri* on aero-engines or armament, etc.

LATE R.A.F.

Another Height Record.

On Friday, 13th inst., Lieut. Casale raised the world's height record to 33,100 feet with his standard-type 29 Nieuport, fitted with a Lumiere propeller. He now proposes to attempt the speed record with the same machine.

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

PARIS NOTES

The Old, Old Tale.

It is said that intrigue and or indecision in high places has a bad moral effect on those whose mission in life is to act and not to order or rescind. However that may be, one has once again to record a change in the directional administration of French aviation. It was at one time hoped that the change, when it came, would mark a clean breakaway from the old, entangling, interministerial, and inter-service method of control, and that an Air Ministry, as a separate entity, would rise phœnix-like, out of the past or dead efforts of the innumerable stop-gap administrations.

Not so, however, owing to the successful opposition of one or more older-established ministries who would, in such case, find themselves with depleted responsibilities, depleted staffs, and perhaps depleted salaries. After many exchanges of view between the heads of the different ministries an agreement was arrived at whereby a separate organisation should be set up under the style and title of "Co-ordination Générale de l'Aviation Française."

By a decree of June 6th in the "Journal Officiel," General Duval, Director of Military Aeronautics at the moment, is charged with the task of initiating this new organisation, retaining, for the moment at any rate, his present post.

In a few words, the idea of this new organisation, to meet the growing needs of a growing industry and enterprise, is best explained as an effort to centralise all projects necessitating careful study, and to decide on policy, whilst at the same time decentralising the execution of the same.

All legal, administrative, or technical questions will be examined by the Central Authority. All information on French or foreign aviation will be collected and circulated to the Departments interested. Whenever a point arises that will involve joint action or the consent of two or more ministerial departments it will be examined by this central organisation.

The central organisation is to have sole control over personnel, the technical service, the constructional side, aerial navigation service, air attachés on diplomatic missions and foreign missions. At the same time each chief of a department retains the administration of his credits and the elaboration of his own experimental or constructional programme.

These programmes must be submitted to the War Minister, who will assure their execution. The choice of constructors is within the province of the department interested.

The War Minister will be responsible for all aeronautical material, and his staff will see to their reception, their construction, their delivery, and repair.

The central organisation will be responsible for creating the trunk lines of aerial communications, and will submit plans for the industrial mobilisation of the aeronautical industry.

The Naval, War, and Colonial Ministers retain autonomy over aviation in their respective spheres.

The Constructional Service will look after the acceptance of material which will be examined subsequently by the technical commission before being delivered to each department. On the other hand, the Ministry interested will nominate the members for the commission to examine material destined for their own department.

Women Aviators.

I have lately had occasion to record the increasing activity in France of women aviators, among them Mme. de la Roche, a well-known pre-war flier with several good performances to her credit. Last week she attempted to make a height record at Issy. Piloting a little G.3 Caudron, she left the ground at 8.38, and returned to earth at 10.27 min. 30 sec., having been in the air, therefore, 1 hr. 49 min. 30 sec., and, according to the officially-sealed barograph, having reached a height of 3,900 metres.

During the inevitable post-flight interview Mme. de la Roche stated that she flew as far as Chartres, rising all the time. The atmosphere at this point was completely covered with clouds, but on descending below them she found it easy to pick out her return journey by means of the railway. The flight took place in the presence of Mr. Louis Zorra, representing the Aero Club de France. It has since transpired that Miss Ruth Law, the American aviatrice, claims to have reached an altitude of 4,240 metres in September, 1917, although it seems that it has never been officially admitted.

Mme. de la Roche is at the moment the holder of the Coupe Femina for the duration record with a flight of 4 hrs. 2 mins.

Mme. de la Roche announces her intention of undertaking some epoch-making flights in the near future, in the interests of civilian aviation.

The World's Height Record Beaten Again.

Last week I was able to record the fact that Lieut. Casale had beaten the height record, but that, in view of other aspirants to this honour, he had decided to try to beat his own with a view to taking the record to well over 30,000 ft. Though he did not accomplish as much as he wished, he beat his previous record by 200 metres. Going up from Issy-les-Moulineaux, he reached a height of 9,500 metres (30,875 ft.) on his 300 h.p. Nieuport Hispano machine. He was forced to descend on reaching this height by reason of a choke in the induction pipe.

The Commission Sportive.

Apropos the numerous attempts on world or national records now taking place, the Commission Sportive of the Aero Club de France reminds all pilot-aviators holding the F.A.I. brevet that to establish officially a record, or to participate in a meeting or other manifestation held under their auspices, they must hold a pilot's licence delivered by the Commission Sportive.

From Paris to Constantinople in One Day.

It is probable that before these lines are in the printers' hands Capt. Lafon will have flown from Paris to Constantinople in one day, or, to put it more poetically, from the Sacré-Cœur to Saint-Sophia.

Capt. Lafon was due to leave on the 11th inst. at 2.30 a.m., but a choke in the petrol feed took so long to clear that valuable time was lost, and he decided to put off the attempt till the next day. He is using an S.E.A. machine fitted with a 400 h.p. Lorraine Diétrich engine. The design and construction of this machine was carried out in the works of H. Potez at Aubervillers, near Paris, and passed its trials shortly before the Armistice. Primarily it is a fighting two-seater, and its official performances are:—Speed near ground, 220 k.p.h.; speed at 5,000 metres, 200 k.p.h.; climb to 5,000 metres, 21 min., with a useful load of 600 kilogs.

Its general characteristics are:—Surface, 38 sq. metres; span, 12 metres; length, 8 metres 50; height, 3 metres 10.

Captain Lafon's intention is to complete the journey in one day, but in three stages. Refilling stops will be made at the Villaverla aerodrome, near Florence, and at the Semlin aerodrome, near Belgrade. The first stage covers 850 kilometres, 150 of them being over the Alps between the Geneva lake and Lac Majeur. Starting away at between two and three in the morning, he hopes to land near Florence about 6.30. Leaving at 7.30 a.m. for the second stage of 800 kilometres, he will attempt to cross the Adriatic between Venice and Fiume, and land at Belgrade about 11.30 a.m. He will stop here for an hour, then start the third stage of 850 kilometres, following the Balkan Express railway line, and landing at San Stefano aerodrome at five in the afternoon. Thus does he hope to cover 2,500 kilometres in thirteen hours.

Captain Lafon joined the military aviation service in 1915, and spent all his time at the Front, on different missions and piloting numerous types of machines. The end of the war found him commanding fighting squadron 174. He is a Chevalier of the Legion of Honour, and has the Croix de Guerre. He will take his mechanic with him on his ambitious and fatiguing flight.

Three Squadrons Across the Mediterranean.

With reference to the contemplated raid by three squadrons of hydravions to Algeria or Tunis, this will be accomplished, or at least attempted, by eighteen machines, divided as follows:—No. 1 Squadron, 6 hyd., G. Levy, fitted with 300 h.p. Renault; No. 2 Squadron, 6 hyd., Tellier, fitted with 350 h.p. Sunbeam; No. 3 Squadron, 6 hyd., Tellier, fitted with twin-engined 300 h.p. Hispano-Suiza.

The affair is to be well organised, as may be judged by the fact that it will be "practised" first. In practice, ten machines per squadron will be used and six finally selected. The pilots are to be chosen from a list of 150. There is likely to be immense interest in the attempt due to the sporting way in which it is being organised: it will be a kind of eliminating trial for machines, motors, pilots, construction and design. The route mapped out is from St. Raphael to Bizerta, to Algiers, and back to St. Raphael. It is hoped that this raid will take place before the end of August, *i.e.*, before the equinoctial season, which would be unfavourable for such an attempt. The machines are to be taken from Paris to St. Raphael by train.

Dirigible Doings.

Vice-Admiral Ronarch has mapped out a series of manœuvres for the dirigibles under his command at the station d'Aubagne (Bouches du Rhone). These craft are due to take up their new moorings in Toulon Harbour this week. Special moorings have been erected.

The "Orion" Destroyed.

The High Seas "Orion," of which so much was expected, has had a comparatively short life. This giant flying boat, weighing four tons and carrying three motors, was at a height of about 100 ft., when one of the motors stopped, the machine dived and fell heavily in the harbour, out of control, where it quickly sank. The pilot, Jean Le Borgne, was badly injured, and the mechanic is missing. Onlookers report that he jumped off just before the machine struck the water, but that he fell under the machine.


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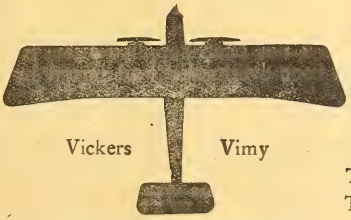
Short Seaplane
225 HP. Sunbeam



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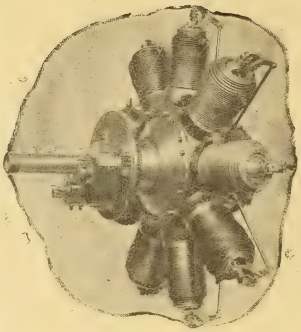
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THE WEEKLY COMMENTARY.

In continuation of the article on "Aero Engine Development, Past and Future," Capt. Sayers describes the general lines along which the aero-engine has evolved, and the nature of the failures to which it is subject, and concludes that those failures which are due to essential parts of the engine itself could be very greatly reduced by a relatively small "easing off" of existing engines, without a great increase in their weight-power ratio.

The failures due to accessories, such as magnetos, carburetters, and their attachments, and controls, are much more numerous and less affected by such a process of easing off.

Some of the aeroplanes built by the British Aerial Transport Co., Ltd., to the designs of Mr. Frederick Koolhoven are described in this week's instalment of the series, "Modern British Aircraft."

Although the B.A.T. Company is a comparatively new firm, Mr. Koolhoven is one of the most experienced and one of the most inspired of aeroplane designers, and the machines built by his firm are of the greatest interest.

It will be remembered that Sir Samuel Waring is the moving spirit of the B.A.T. firm.

A further instalment of Lieut.-Col. Holt's article on the Holt pilot parachute system appears on page 2439.

THE DEVELOPMENT OF THE AERO-ENGINE, PAST AND FUTURE.—II.

By Capt. W. H. SAYERS, late R.A.F.

The classification of aero-engines into the overloaded "car type" and the "specially designed" class is very general, and all aero-engines are to some extent or other hybrids between the two. Nevertheless, there are very few which do not distinctly incline towards one or other of these classes in their general arrangement.

Roughly, all the vertical and vee type engines may fairly be considered as developments of the car type, and all the radial, both stationary and rotary, as of the "special design" class.

Engines of the "broad arrow" types, such as the Napier "Lion" and the 450 h.p. Green, and the 400 h.p. 16 cylinder Clerget, which has four rows of four cylinders each, arranged as a "cross," are amongst the more noticeably intermediate types.

The Earlier Rotaries.

The earlier specialised types of aero-engine—for instance, the Gnôme rotaries—sacrificed practically every consideration to the weight of the engine itself. High-grade materials, machined everywhere to fine limits, were employed throughout.

Water cooling was abandoned, and to overcome the difficulties of air cooling relatively large cylinders, low compression—and therefore low explosion temperatures—rotation of the cylinders to increase the air velocity past them, and copious lubrication were adopted.

Low compression means low thermal efficiency; the rotation of the cylinders requires a large part of the engine power output to overcome air resistance, and consequently the fuel consumption of this type of engine was large.

Stresses in the cylinders and crankcase, due to centrifugal force, were so great that high tensile steel was the only possible cylinder material. Such steels are not ideal for cylinder walls; they score easily, and pistons seize in steel cylinders on the slightest provocation.

In spite of these and other troubles, it was possible to fly with these engines in cases where it was impossible with others.

Therefore the designers of other types of aero-engines were forced to lighten their products in an endeavour to equal the rotary type.

The End of Cast-Iron Cylinders.

The "car type" engine abandoned cast iron for copper as a water-jacket material, or adopted air cooling, sometimes with a fan blast as an adjunct, set two rows of cylinders in vee form to drive a common crankshaft, thus saving weight in both crankcase and crankshaft, used steel castings instead of iron ones for cylinders, substituted steel or aluminium for C.I. in their pistons, and generally followed the lead of the rotary in the matter of using materials of the highest available grades throughout the working parts.

This by itself did not suffice. To equal the rotary in performance the car type engine had still to cut down its weight/power ratio, and therefore the process of pushing up the power output of a given-sized engine commenced.

High speed of rotation of the engine itself, increased compression ratios and the consequent mean effective pressures have been the result.

High speed of rotation has directly led to greater attention to balancing of the moving parts and to the very general adoption of reduction gears for the airscrew drive. The indirect effect of the increased gas velocities due to high speeds upon the design of cylinder heads, valve gears, and induction systems are practicaly inseparable from those due to the other methods adopted for increasing the power output.

In low compression, low speed engines, small variations in combustion chamber volume are unimportant, and valve pockets cast on the side of the cylinders are practicable.

With high compression ratios it is important to keep the clearance volumes uniform throughout the cylinders, and cylinder heads which can be machined all over are therefore imperative. Valve pockets have therefore disappeared, and overhead valves are universal.

With overhead valves the overhead camshaft has followed more or less as a matter of course, with the advantage of dispensing with long tappet rods, which, by springing when opening a valve and by adding to the mass which has to be put into motion by the valve spring at closing, reduce the effective opening of valves operated through them.

By a continuous process of improvement in detail design the power output from stationary engines of given dimension of the car type has been raised in an astonishing degree, at the same time conserving the superior reliability and the great fuel and oil economy of the type.

But the specialised types of aero-engine have not stood still.

Air-Cooling Advances.

Improvement in the design of cylinders, securing better cooling, such as careful fin arrangements and the deposition upon steel cylinders of metal of high heat conductivity, has enabled the air-cooled engine to run at compression and explosion pressures which secure nearly as high a thermal efficiency as is possible with the water-cooled cylinder.

The development of alloy steels and their heat treatment has made it possible to produce cylinders of high tensile steel which require little more lubrication than do cast steel ones.

These two developments, in combination with the great saving in crankcase and crankshaft weight which is possible with the radial type of engine, have led to the production of air-cooled radial engines of great power, great fuel and oil economy, and of very low weight per h.p., which, so far as the performance which can be obtained from any given machine is concerned, cannot be equalled by any of the more conventional types of the water-cooled engine.

At the same time the radial air-cooled engine has the reputation of being less reliable than the water-cooled type.

The Needs of the Future.

Considering the requirements of the future, particularly with an eye to the development of commercial aerial transport, there can be no doubt that the aero-engine of the future must be, above everything else, reliable.

It must also be economical, and as light as possible for its power, but these desiderata will occupy more or less the same secondary position as reliability has occupied during the phase of engine development which ended with the cessation of hostilities.

To forecast the probable, or rather the desirable, line of future evolution it will be well to consider what are now the main causes of failure of aero-engines.

There can be no question that, so far as the better class of engine is concerned, more than 75 per cent. of all the failures which occur in flight are due to engine accessories.

Failures of magnetos, ignition plugs, water circulation fittings, carburetters, oil or petrol pumps, pipes, filters, and the like outnumber the cases of actual failure of any essential part of the prime mover itself by certainly three to one.

Of those failures which occur to the engine parts themselves, failures of valve springs and valves are the most prevalent.

Breakages of the gear drive to the propeller in high speed engines are not unknown, but are, strictly speaking, no more to be classed as engine failures than is the crashing of the gear box of a car. In so far as the reduction gear is usually made as an integral part of the power unit, and is designed by the engine designer, it does concern the engine designer, however.

Failures of Essential Parts.

Taking the relatively small number of failures of essential parts as distinct from accessories, it is very obvious that these can be indefinitely reduced by easing up any given motor.

Thus all those loads which lead to failure of valves, valve springs, valve rockers, etc., are acceleration loads, and are proportional to the square of the speed of rotation of the engine.

Since the power of an engine varies, if anything, less rapidly than does its speed, the loads in such parts are reduced at a much greater rate than is the horse-power, if the speed is cut down.

The reliability of materials subjected to this type of load increases much more rapidly than in the inverse ratio of the load applied to it, and therefore a comparatively small reduction in speed and horse-power adds greatly to the reliability of such parts.

And of Accessory Parts.

So far as the accessory failures are concerned, a reduction of running speed will not have so large an effect.

Such a reduction helps towards greater reliability on the part of the magneto, all forms of toothed gears, etc., and makes it easier to secure even gas distribution to a number of cylinders, and to some extent reduces the ill-effects of unevenness in such distribution.

By allowing a greater interval between successive explosions it allows a longer interval for cooling of cylinder walls and sparking plugs, thus reducing both the mean and the maximum temperatures in the cylinder.

Bearing pressures, in so far as they are due to the acceleration of moving parts, are reduced in the same manner as are the loads on valves, valve springs, and rockers, and lubrication conditions are thus eased.

There is little of the engine proper which does not gain immensely by a small reduction in the speed of running from that at which it just does give trouble occasionally.

With its accessories unfortunately this does not hold to anything like the same extent.

If it be admitted that the aero-engine must carry such appliances as carburetters, radiators, magnetos, with the attendant mass of connections and controls which they imply, then there is no way of avoiding 75 per cent. of all the troubles from which they now suffer, other than that of careful design and installation of such accessories.

That there is room for an immense improvement in this respect is undeniable, but is it the only hope?

(To be continued.)

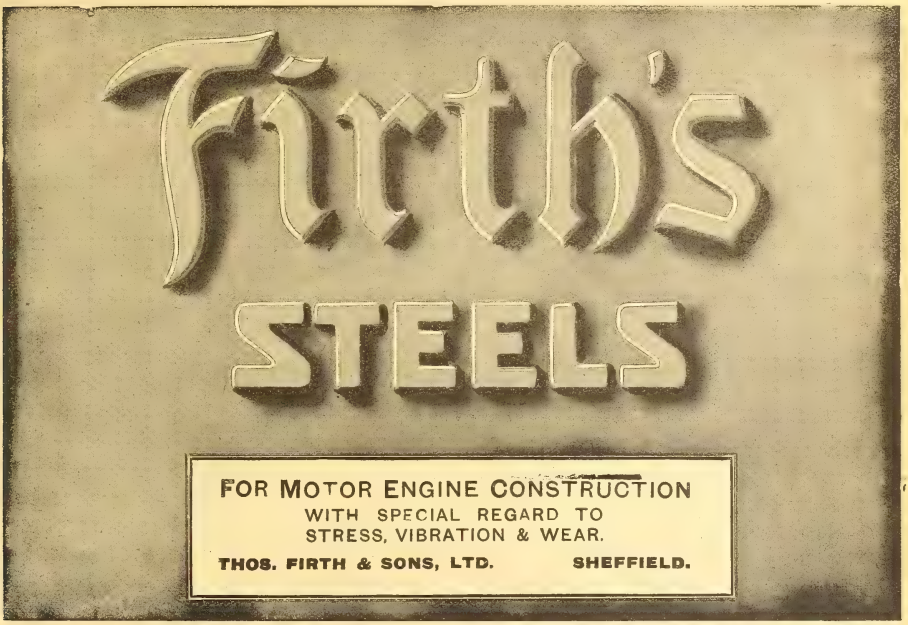
"A LITTLE KNOWLEDGE——"

In "Engineering," of May 30th, Sir George Greenhill discusses the possibilities of the Atlantic flight in a distinctly learned manner.

Unfortunately, his assumptions are, in the main, based upon such misleading factors as to lead him to state, referring to the published statements made by the Handley Page firm that 2,000 gallons of petrol will give a range of 2,500 miles in the case of their trans-Atlantic machine, that:—" . . . We read a claim of petrol consumption at the rate of 0.4 lb./h.p. hour, whereas it is prudent to double this figure, or to reckon an allowance of more like a pint, or 1 lb., ... lubrication included, and at 100 knots the petrol supply of 2,000 gallons must not be expected to last more than ten hours—a flight of 1,000 miles." . . . . "And so on for the other machines where any figures are divulged which can be subjected to the test of arithmetical calculation."

"It seems prudent . . . . to assign a diameter of action of the H./A. (heavier-than-air) machine of not more than 800 miles . . ."

In the issue of June 6th, Mr. J. D. North has reproved the author for lending the weight of his distinguished name to such utterly unfounded statements



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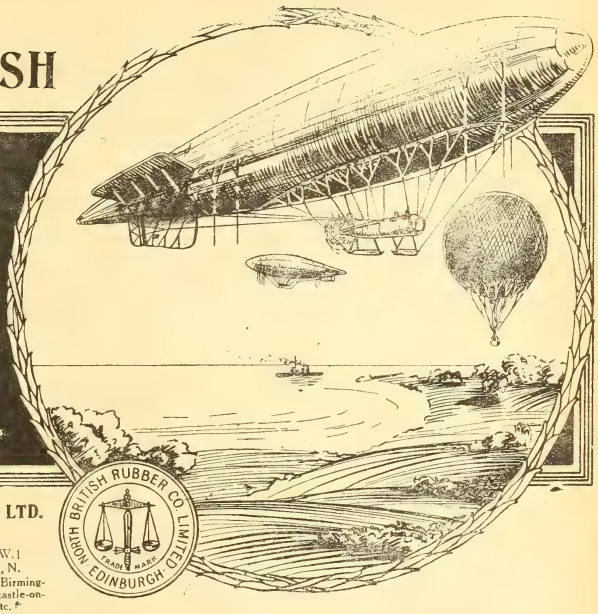
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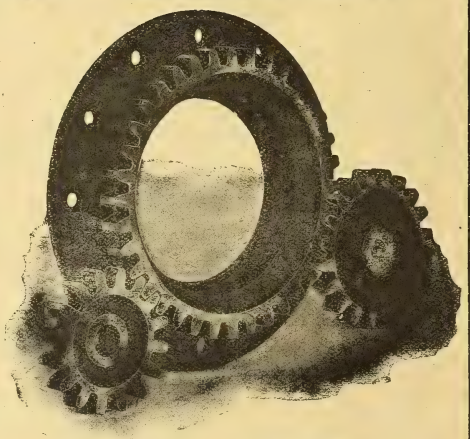
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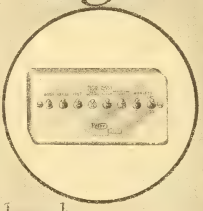
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Acock's Green 103 & 104.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London."
Willesden 2400 (3 lines).

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4670.

Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricodon, Fen, London." Avenue 34 and 35.

Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.

Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, 'Phone, London." Hampstead 2403 & 4404.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond. "Aeros, Richmond." Richmond 1681.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

Dopes—

Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellulate, London." Regent 4046.

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 440.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.

Engines and Parts—

Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries" Dumfries 281-282.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercédès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1910.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London" Gerrard 8026.

Rolls-Royce, Ltd., 11 and 15, Conduit Street, W.1. "Rolhead, London." Gerrard 1654-5-6.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 985.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames." Walton-on-Thames 220.

Electrical Accessories—

Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1984.

Brown Bros., Ltd., Gt. Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston road, London." Museum 70.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London." Willesden 2480.

Electric Cables—

E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 242.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W. "Installing, Euston road." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines)

Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

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Fluxes—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).
The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.
Voucher, Co., Auto Tool Works, Walsall "Voucher Walsall." Walsall 0196.

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407

Glue—
Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Beccofin, Cannon, London." City 1206.
Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid.) "Excroiden, 'Phone, London." Avenue 4611-2.
Meudine Co., 8, Arthur Street, E.C. Bank 5873.

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340

Heating and Ventilating—
Chas. P. Kinnell and Co., Ltd., 65 & 65A, Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 763.

Instruments—
British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

Insurance—
Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 6944.
Bray, Gibb & Co., Ltd., 166, Piccadilly, W.1.
S. Sackville & Sons, Duchy Chambers, 4, Clarence Street, Manchester.
Harold Townend, Ltd., 13-14, Abchurch Lane, King William Street, E.C.4. "Carinsur, London." Central 156 (2 lines).
Percy Wingfield, 22, Newgate Street, E.C.1. City 4672.

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London "Pegamoid, Cent., London." City 0704 (2 lines).

Lubricating Oil Refiners and Merchants—
W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines.)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 430.
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asterobial, Coventry." Coventry 278.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham." Central 499 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43. Avenue 1432.

Metals in General—
Samuel Mercer & Co., 198, Upper Thames Street, E.C.4 "Reconciled, Cannon, London." City 6342.

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Gt. Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1 "Installing, Eusroad, London." Museum 70.
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros, Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1 "Imbrownad, Bethroad, London." London Wall 6300.
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham." Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115.

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 282-283.
Mann, Egerton & Co., Ltd., 279/381, Euston Road, London, N.W.1. "Manegecar, Eusroad, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing."

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—
C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London" Central 11305 & 13466.

Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)
C. G. Spencer & Sons, Ltd. (See under "Balloons").

Piston Rings—
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.
Integral Propeller Co., Ltd., "Aviprop, Hyde, London." Hendon 9. Kingsbury 104.
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 29547-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth." Letchworth 20

Rawhide Hammers—
Ira Stephens, Whitelands Leather Works, Ashton under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1 "Masticator, Isling, London." City 3811 & 3812.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (7 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37.

Searchlights & Landing Lights
Brown Bros., Ltd., Great Eastern St., E.C.1.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10 "Rodynalite, Phone, London." Willesden 2480

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London." Vic 4830
British Metal (Kingston), Ltd., Kingston-on-Thames. (Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).



The · Aeroplane ·

Accumulators—
The Chloride Electrical Storage Co., Ltd., Clifton Junction, near Manchester. "Chloridic, Pendlebury." Central Manchester, 1655. Pendleton, 11.

Acetylene Welding Plant—
Acetylene Corporation of Great Britain, Ltd., The, 42, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone London." 3540 Victoria (3 lines)

Aeroplane Manufacturers—
Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 220.
Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.
British Aerial Transport Co., Ltd. Head Office: 38, Conduit Street, London, W.1. "Batigram, Reg, London." Mayfair 657, 658.
Works: Hythe Road, Willesden, London, N.W.10. "Aerbrians, Phone, London." Willesden, 2272, 2273.
British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3006.
British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hampstead 5551.
Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 2403 and 4424.
Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2604 (2 lines).
Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1170.
Gosport Aircraft Co., Gosport. "Flight Gosport." Gosport 217.
Grahame-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.
London Office, 22, Regent Street, S.W.1. Regent 2084.
Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydroplid, Crickle, London." Hampstead 7420.
Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St. James, London." Regent 912.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines)
Martinsyde, Ltd., Brooklands, Byfleet, "Martinsyde, Weybridge." Woking 331; Byfleet 171.
"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London." Willesden 2455.
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).
The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2230-2231.
Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester."
Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.
Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tasted, Phone, London." Regent 378.
The Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 988 (8 lines)
The Supermarine Aviation Works, Ltd., Southampton. "Supermarin." Woolston 37 (2 lines).
Tarrant, W. G., Byfleet, Surrey. "Tarrant, Byfleet." Byfleet 1, 2 & 3.
Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyta, Knights, London." Kensington 6510.
Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.
White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Airships—
Airships, Ltd., High Street, Merton. Wimbledon 1314.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines)
Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 378.
C. G. Spencer and Sons, Ltd. (See under "Balloons").

Aluminium Castings (Sand and Die)
Coan, R. W., 219, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 3846.

Balloons—
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines)
C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronaut, London." Dalston 1800.

Bent Timber Parts—
Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Euspuare, London." Museum 396. Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 15.

Bearings (Etonia Cast Phosphor Bronze)
Brown Bros., Ltd., Gt. Eastern St., E.C.2. Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3027.

Blowpipes (Oxy-Acetylene)—
Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic. 4830.
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic. 3540 (3 lines)

Bolts—
Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16. Dalston 2500 (2 lines).

Books (Aero Engines)—
Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2.

Buildings—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.
Rubery Owen & Co., Darlaston, South Staffs.

Cable Coverings and Cable Controls—
The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green." Acock's Green 103 & 104.
Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—
Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4670.

Casein—
Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricolon, Fen, London." Avenue 34 and 35.

Clothing—
Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.
Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines)

Component Parts—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).
Brown Bros., Ltd., Gt. Eastern St., E.C.2.
Central Aircraft Co., High Road, Kilburn, N.W.6. "Aviduction, 'Phone, London." Hampstead 2403 & 4424.
P.D.V. Aircraft Co., Ltd., Princes Street, Richmond. "Acros, Richmond." Richmond 1681.
Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thomseon Bros., Bilston." Bilston 10.

Cords, Tapes, and Threads—
MacLennan, J., & Co., 30, Newgate Street, E.C.1. "And at Glasgow." City 3115.

Dopes—
Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312.
British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 4040.
The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Ceilon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 440.
Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Oleoline, Strat, London." East 955.

Engines and Parts—
Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1.
Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.
The Cosmos Engineering Co., Ltd., Fishponds, Bristol.
Dudbridge Iron Works, Ltd. (Salmson), 87, Victoria Street, London, S.W.1. "Aeroflight, Vic, London." Vic 7026.
Gordon Watney & Co., Ltd., Weybridge. "Mercedes, Weybridge." Weybridge 550 (7 lines).
Green Engine Co., Ltd., Twickenham. Richmond 1203.
Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1910.
Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Sitrifier, London." Gerrard 8626.
Rolls-Royce, Ltd., 11 and 15, Conduit Street, W.1. "Rolhead, London." Gerrard 7654-56.
The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954. "Deasy, Coventry."
Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 986.
The Gnôme & Le Rhône Engine Co., Ltd., 27a Buckingham Gate, S.W.1. "Eleven-fold, London." Walthamstow 811 (2 lines).
Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames." Walton-on-Thames 220.

Electrical Accessories—
Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1084.
Brown Bros., Ltd., Gt. Eastern St., E.C.2.
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.
Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).
Maun, Egerton & Co., Ltd., 1/7, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London." Willesden 2480.

Electric Cables—
E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 242.
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.
Maun, Egerton & Co., Ltd., 147, Cleveland Street, London, W. "Installing, Eusroad." Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—
W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines)

Flare Lights—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.



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Fluxes—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).
The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196.

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

Glue—
Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Beececolin, Cannon, London." City 1206.
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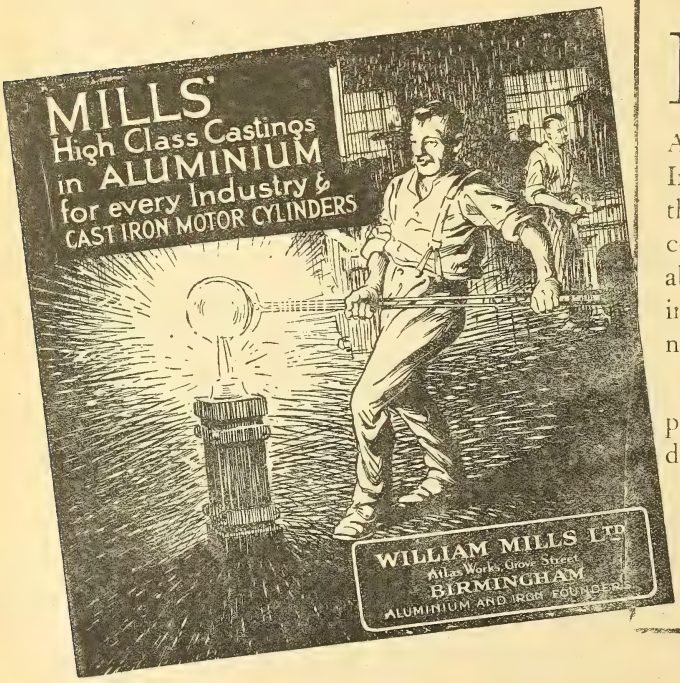
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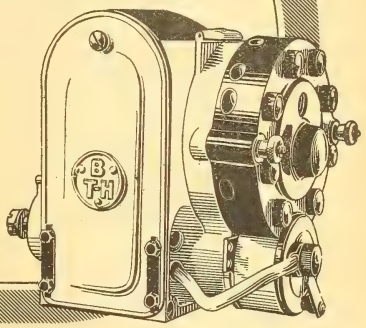
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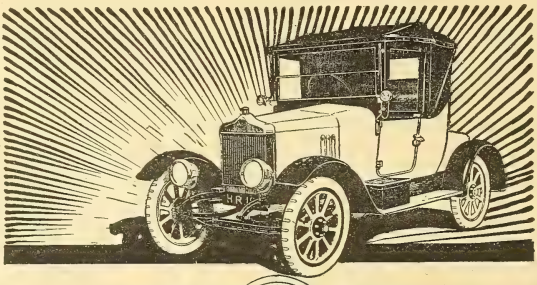
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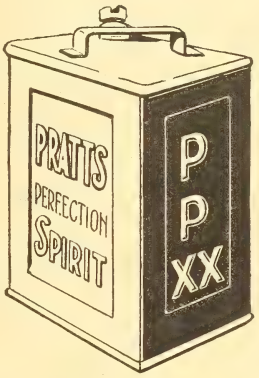
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NOTES ON PARACHUTES AND PARACHUTE FLARES.—III.

By Lieut.-Col. H. S. HOLT.

(Continued.)

Type B.

In this type the writer employs a delay or timing mechanism in connection with the pilot parachute. (See last article.) The general arrangement is the same as in Type A except that in place of the spring-lid D, a special kind of flap is employed. This is set in motion by the man in the aeroplane leaving his seat or climbing out of the cockpit of the machine, the method being as follows:—The delay mechanism is locked by a pin to which a short length of cord is attached and made fast at its other end to the aviator's seat, or to the fuselage. The cord is of sufficient length to enable him to move about but not to leave the machine. A pull on the cord withdraws the pin and releases the delay. This delay mechanism is made of uncorrodible material and requires no lubricant of any sort. It is attached to the bottom of the main receptacle, and the cable from the centre of the main parachute M goes to the release bolt as before and thence to the pilot parachute N.

Instead of the spring lid the writer employs a flap; under this flap, which is held down by a bolt attached to the delay mechanism, the pilot parachute is stowed. Attached to this pilot parachute there is a secondary smaller pilot parachute built of very thin silk with silk connections to the first pilot. This is packed on the top of the first pilot under the flap.

The delay mechanism can be set to give a delay of anything from ½ to 5 seconds, thus enabling the passenger to jump clear of the aeroplane or airship before the pilot parachute becomes operative.

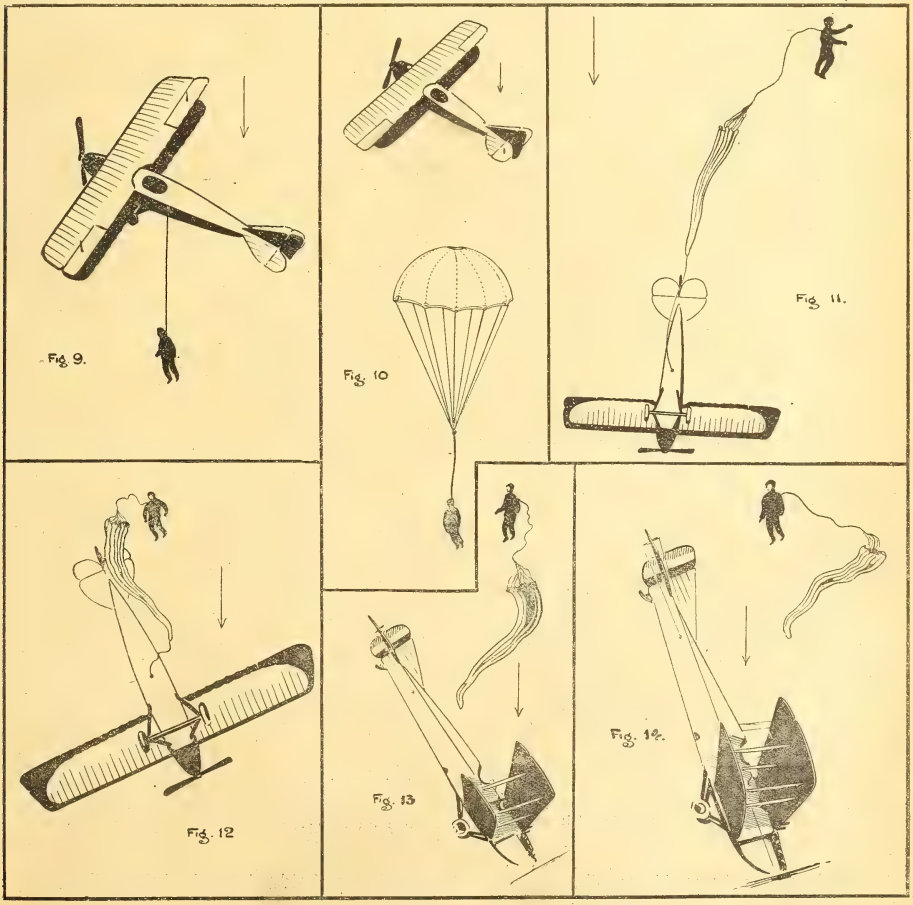
At the same time in both this and type A there is no mechanical connection between the parachute and the aeroplane from the time the passenger leaves the latter.

Type B with the delay mechanism is specially intended for carrying out realistic trials with dummies. With this arrangement the parachute case and the dummy can be strapped to the side of the fuselage, and if the delay mechanism is put in use it will fall like a bomb at first. Thus it will be possible to try experiments with aeroplanes flying at all sorts of angles, which would not be safe with any of the existing parachute systems.

Below various illustrations are given with the aeroplane falling in different positions and showing what might be expected to happen with the ordinary single parachute system and with the Holt "Autochute" system.

As already pointed out, the smaller the parachute the easier to ensure absolutely certain opening, and if drops are made over water, even if the main parachute did not open, the passenger would only reach the water with a velocity of something under 90 feet per second, which is only equivalent to the rate he would reach the water from a dive of less than 100 feet.

But for experimental purposes even the risk of the pilot parachute not opening can be eliminated in this way, if an airship instead of an aeroplane is used. The airship is reduced to a slow speed. The pilot parachute is then released and opens with the draught, then, and not till then, the passenger jumps off; this, of course, should be done over a lake or over the sea.



Description of Figs. 9 to 17.

Fig. 9.—Single Parachute.—Machine falls sideways and slower than the man, but difference of speed is not sufficient to withdraw the parachute, and the man and machine crash to the ground.

Fig. 10.—Single Parachute.—Machine falls sideways and slower than the man. Parachute opens, but probably the machine will fall on top of it.

Fig. 11.—Single Parachute.—Machine falls end on and faster than the man. The parachute is pulled out below him, and will almost certainly become entangled in the tail. Even if that does not happen it is probable the man will fall onto the parachute and become entangled in the lines.

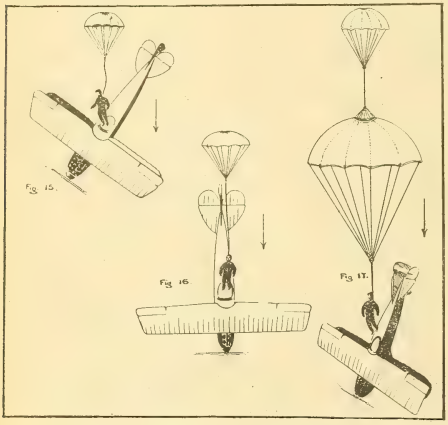
Fig. 12.—Single Parachute.—The machine falls sideways and faster than the man. But the wind is in the wrong direction, or not strong enough to overcome the suction of the falling machine, and the parachute is sucked into and becomes entangled in the tail.

Fig. 13.—Single Parachute.—Machine is falling, as in Fig. 12, but there is no wind and no suction, or enough wind in the right direction to overcome suction. The man falls on to the parachute.

Fig. 14.—Single Parachute.—Machine falls, as in Figs. 12 and 13, but the wind is in the right direction and sufficient to overcome suction and blow the parachute to one side. In this case the man should fall clear of his parachute and have a fair chance of escape.

Every balloon observer knows that with the ordinary single parachute he must jump *before* his balloon begins to fall.

With the "Autochute" it matters little what the relative velocity of fall of the man and machine happens to be.



"Autochute" Type A

Fig. 15.—Machine falls sideways. Aviator releases pilot parachute, which draws him out of the machine, but retains the main in its case by pressing the lever. As soon as he is clear of the machine he releases the main parachute. Aviator should certainly escape (compare this with Figs. 9 and 10).

Fig. 16.—The aviator releases the pilot parachute, as in Fig. 15, but retains the main in its case. The pilot parachute may foul the tail if the machine is falling absolutely end on. But the pilot parachute is only 6 ft. diameter, and there is a good chance of escape. As soon as the aviator is clear of the machine he lets go of the lever thereby releasing the main parachute (compare with Fig. 11).

Fig. 17.—Machine falls, but not in a perfectly vertical position. Aviator releases pilot parachute, as in Figs. 15 and 16. If he is falling at a very high speed, he will retain main parachute as before till the pilot parachute has reduced his rate of fall, thus avoiding a heavy shock when the main parachute opens. But if he is not falling very fast he may allow the pilot parachute to pull out the main parachute at once.

Comparing the illustrations above we see that under the circumstances represented in Figs. 9, 10, 11, 12 and 13 with the single parachute the aviator would almost certainly have been killed. In the "Autochute," on the other hand, he should certainly escape in every one with the exception of Fig. 9, and even in that he has a fair sporting chance. It may be objected to that in some of these cases the writer presumes that the main parachute is retained in its receptacle for a certain length of time by the voluntary action of the aviator.

It is usually supposed that from the moment the aviator jumps off the machine till the main parachute is opened, he cannot be expected to retain any volition of his own, but must be considered more or less as a dummy, but with the "Autochute" system it must be remembered that he is falling under the pilot parachute at a strictly limited velocity and not like a stone.

But even if he had not sufficient coolness to retain the main parachute for a time, he would have a fair chance of escape in all these cases, as he is independent of the rate of fall of the machine.

If Type B is used, the whole action is automatic, and the passenger has absolutely nothing to do but to jump overboard.

It is said, the writer does not know with what truth, that the Authorities are rather adverse to the installing of parachutes as a standard equipment for aeroplanes, for two reasons:—

1. That it might frighten the civilian off flying. This seems rather like the ostrich burying its head in the sand. One never hears that anybody was deterred from making a sea voyage because they saw lifeboats in the davits.

2. The other supposed reason is that that they think an aviator might be apt to leave a machine in the parachute when there was still a chance of saving it.

There may be perhaps something in this reasoning if the single parachute system which gives so little chance of saving life after a machine starts to fall is employed; but, on the other hand, it is a strong argument against the installation of this system.

To sum up, then, it would seem, if the writer is correct in his contentions, the aviator in the future will have the choice of two alternatives—they may either instal one of the ordinary single parachute systems, which, in the majority of peace-time accidents, will almost certainly be quite useless; or they may choose the compound system, which, provided the aeroplane is left at some height from the ground, will afford a more than sporting chance of escape under almost any conceivable conditions.

PARACHUTES.

The following letter has been received:—

Sir,—My attention has been called to an article in a recent issue, entitled "Notes on Parachutes."

I think some of the author's statements are open to criticism. In particular I take exception to his opening remark that "the A.F. Technical Department is in possession of all available knowledge concerning previous experiments," etc., etc.

I yield to no one in appreciation of the Technical Department's patient and scientific investigation of the parachute problem, but it should be remembered that some "outsiders" were experimenting with parachutes years before some of the Technical Department had even *seen* a parachute, and to say that they know the result of all these experiments is going a little too far.

I may mention as an instance that it was only a few months ago that I was asked by members of the Technical Committee of the R.A.F. to explain the action of the Tandem or Compound Parachute System, as they had no knowledge of it and had never seen it used.

I will only make one other comment, or this letter will be too long. A quite arbitrary distinction is drawn between what the writer terms "positive and non-positive types."

"Positive," like "streamline" and "Mesopotamia," is a blessed word, but it would be interesting to know why, in the writer's opinion, a single parachute system is positive and the compound non-positive."

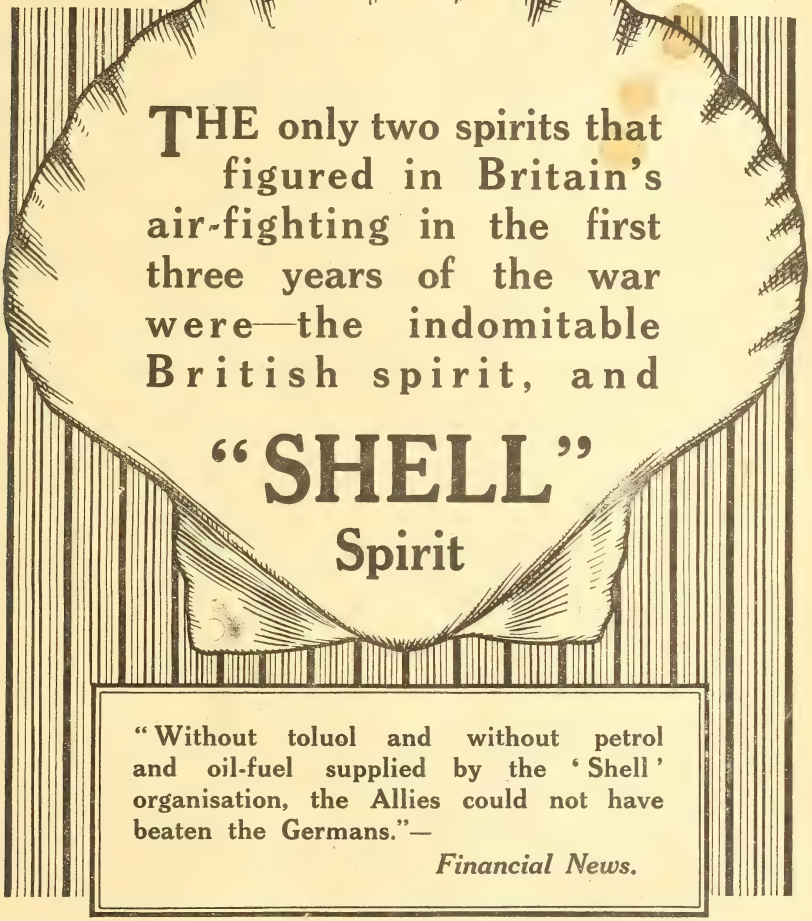
As a matter of fact, as I hope to show in my next paper on parachutes,* the compound system should be more certain in action than the single, if only because of the absence of "suction," that ever-present and sinister danger that attends all single parachute systems, though some makers may lessen the danger by ingenious and costly receptacles or "holders" and elaborate methods of stowing the lines.

But this is not the main point.

The real fact is that aviators are faced with two alternatives. They can either have one of the well-designed single parachute systems hitherto in use, which are good enough to escape by, provided the aviator leaves his machine *before it begins to fall*, but which is useless afterwards. Or he may adopt the compound system, which provides an almost equally good chance of escape, whether the machine is falling or not, when the aviator leaves it.

(Signed) H. S. Holt, Major and Hon. Lt.-Col.

(* The paper referred to is reproduced above.—Ed.)



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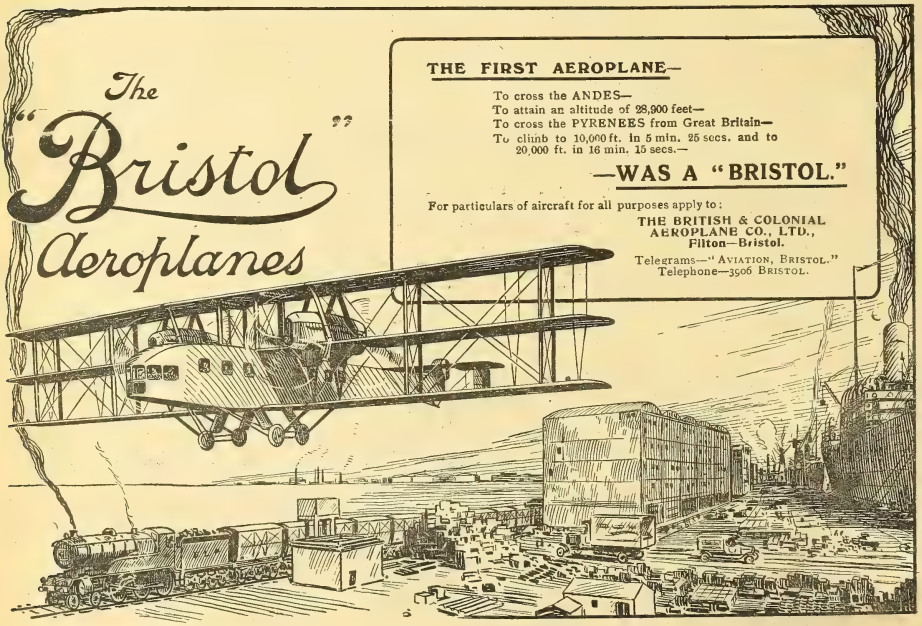
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MARKET TOPICS.

Prices are for Quantities on Usual Terms.

June 11th, 1919.

COPPER.—This market is still quiet, and consumers are not yet showing any interest in the metal, nevertheless, prices continue firm; in fact, it is not expected that prices will decline much further for some considerable time, and buyers would not be taking great risks if they commenced to cover their future requirements. There are, of course, other factors which are influencing consumers, including the high prices prevailing in the Iron and Steel market

These remarks do not apply to manufactured Copper, the prices of which compared with Ingot Copper are very high, and there is no reason why they should not be reduced, even after allowing for high wages and other increased costs.

The market in America is a little more active, but the stocks are still very high, the estimated amount being about 500,000 tons, and the production, although reduced approximately 60 per cent., is still estimated to be about 20,000 tons per month in excess of the consumption.

It is understood that American stockholders have been compelled to seek financial help from the banks to enable them to carry their stocks; nevertheless, the latest reports indicate that there is a certain amount of optimism prevalent, but it remains to be seen whether expectations will be fulfilled. So far as can be observed at present the future does not look very promising.

Comparative Prices.

	Per Ton. £ s. d.
To-day, June 11th	80 10 0
Last week	78 10 0
Last month	76 12 6
Average price, 1918	115 10 0

TIN.—The position of the Tin market continues uncertain and irregular, and consumers lack confidence. The outlook is very obscure and does not encourage optimism. The stocks everywhere are large, and although it is expected that America will make large purchases when the embargo has been lifted, the reports that their buyers have been busy placing orders in the

He also stated that the Government was not prepared at present to impose any restriction upon the importation of Iron and Steel in view of the demand in the country.

It is also reported that American manufacturers are quoting Australian firm prices which are £2 per ton cheaper than British prices. The same remarks apply to Steel Billets for delivery into this country, the difference in price being 5s. to 10s. cheaper than British makers.

It will be seen from the foregoing that the position is not at all healthy.

The Labour position is again causing anxiety. Those firms which are fairly booked up with orders cannot get a satisfactory production, the reduction in working hours having, in the majority of cases, resulted in a reduction of output per man per hour, and the promises of the Labour leaders are not being fulfilled. It will be remembered that they stated emphatically that the reduction in hours would not result in a reduction of output.

The workers fail to realise that national prosperity can only be attained by every man giving maximum production; this is an economic law which needs to be driven home, as the majority of the workers appear to be intent upon giving as little output as possible.

It is also understood that in the north of England engineers have refused to work any overtime whatever until the 44-hour week has been granted them. If this kind of thing goes on it will certainly result in disaster, export trade will disappear, owing to the prohibitive prices which manufacturers will be compelled to pay, and the result will be idle works, out-of-work demonstrations, hunger marches, etc.

A report has recently been received that German Steel is now being offered on the Continent at lower prices than either American or British prices.

Another factor which is causing buyers to hesitate is the covering clauses which are still being inserted in quotations, and buyers can hardly be expected to place large contracts where quotations are not firm. The High-speed Steel and Cast Steel market is still very quiet.

TIMBER.—Although there has during the past week been a reduction in the price of English Ash, the Timber market, generally, appears to be hardening, and the decline in Ash prices has

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Nickel ..... £195 per ton.

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Phosphor Copper.

Ton lots .....£140 to £146

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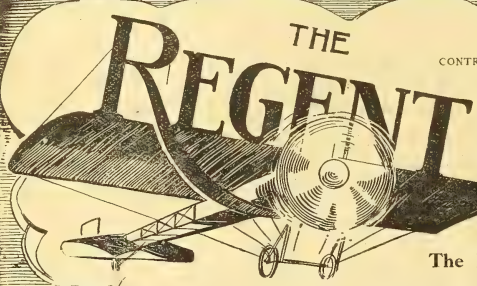
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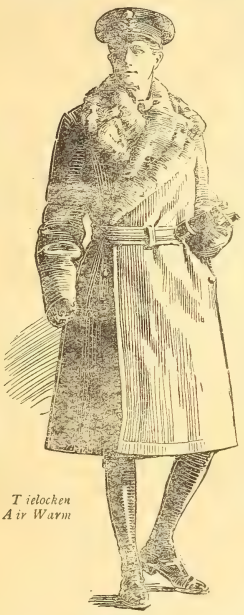
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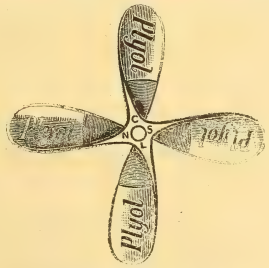
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COMMERCIAL AERONAUTICS & CIVIL AERIAL TRANSPORT

PILOT AND NAVIGATOR: A QUESTION OF EDUCATION.

By "Medway."

I feel sure that no one will be more cordially in agreement with me than Mr. Hawker himself when I say that, in my opinion, the balance of publicity given to him and to Grieve was very badly maintained in many quarters. The risks run by the two were absolutely identical, and it is an open question on which of the two the greater responsibility devolved.

My readers are already aware that I hold what some people will regard as extremist's views on the subject of the trans-Atlantic Flight, possibly because it is my job to endeavour to look at all important aerial events from a purely commercial standpoint. In pursuance of this object I have endeavoured to find out what has really been learnt from the trans-Atlantic attempts up to the present, they can fairly be said to have sufficient value to justify the extreme risk of very valuable lives.

From this point of view it seems to me that the greatest achievement of all up to date has been that of Grieve, who apparently navigated his aeroplane accurately for something over 1,000 miles of trackless sea under atmospheric conditions that were by no means favourable, and without any extraneous guidance. I am not qualified to say whether, before this performance, there was any large number of people holding the convinced opinion that the thing could be done with certainty. From the organisation of the American Navy in connection with its own aerial enterprise I assume that, in many well-qualified quarters, it was supposed that something much more tangible and visible was needed as a guide.

Now, in point of fact, the system of what may be called light-ships devised by the American Navy did not pan out particularly well in practice Despite its assistance, two out of three of the seaplanes failed to reach the Azores as a result of trouble connected with navigation and not with machinery. It would seem, therefore, that the main lesson we have learnt up to the present is that aerial navigation across oceans will be definitely a matter of scientific observation of position under circumstances of considerable difficulty. I suggest that even on over-land routes the same will, broadly speaking, hold good.

The Scientific Navigator.

The navigator must, therefore, be a scientist of no mean attainments and a man of comprehensive experience, capable of meeting and overcoming unexpected difficulties and thinking clearly under conditions of considerable stress.

On the other hand, as time goes on, it seems to me that the work of the commercial pilot will become more and more a matter of routine. He will always need to have a head on his shoulders, but that difficulties with which he personally will have to fight will be more in the nature of a combination of those encountered by the steersman of a sailing ship and the engineer of a steamer.

As the size of aeroplanes increases, the duties of the pilot will be more and more divorced from those of the engineer. Certain members of the crew will be carried solely for the purpose of steering, others for the purpose of keeping the machinery in perfect running order, anticipating and dealing with possible breakdowns.

We shall, in short, reach the point at which the crew becomes a sort of miniature replica of the crew of a liner. In that case, the chief navigator will occupy the position of captain. I can imagine that the day will come before very long on which, when some exceptional test is performed, the Press of the world will ring with the name of the navigator, and comparatively little will be heard of the name of the pilot. That day is not yet. At present the tendency is in the opposite direction, but we are already beginning to realise that the thing is not quite as it should be.

The Need for Education.

If my general ideas turn out to be right, then it follows that the really responsible and well-paid positions in connection with aerial transport will not go to the men whose sole or main qualification is their ability to pilot an aeroplane. To my mind, there will be no room for the pilot pure and simple in any but the subordinate ranks. In other words, the educated man who wishes to make the air his profession must be incidentally a pilot, but the main part of his training will have to be in matters connected with navigation, wireless telegraphy, and the use and understanding of delicate scientific instruments of many kinds.

If there are any men whose qualifications are simply those of the war pilot, and who are looking to a future in which they will hold prominent positions in connection with commercial aeronautics, I suggest that the interval that will have elapsed before new projects mature ought to be filled by a very strenuous course of scientific training. We have a series of schemes for assisting demobilised officers to undergo vocational courses, but so far as I am aware no specialised course has been devised which would fit the young pilot, who left school to join the Air Force, to perform a feat such as that which stands to the credit of Grieve.

Is not this a state of affairs that is worthy of the attention of one of our Universities? Cambridge has the scientific and mathematical experience, and the younger Universities at big seaports —as, for example, Glasgow and Liverpool—must necessarily be equipped for the teaching of navigation and nautical astronomy. Who will be the first to offer a real course of training for officers of Aerial Mercantile Service?

"PUSSIGRAMS, ETC."

The following letter has been received:—

Dear Sir,—I see that in your issue of the 14th inst., your correspondent, "Medway," has taken up the question of "aerograms" in a satirical vein. Firstly, he credits me with being a man of many ideas, but the credit of this idea is, in the first place, due to Mr. A. S. Baxendale, an expert on cable matters, and the matter was brought before me, owing to its great interest, a long time ago, by Colonel O'Gorman, a member of my staff.

"Medway" says: "Let us examine the process critically," and whilst it is an excellent idea, I do not think he has quite carried it out. A great deal of his criticism refers to "mutilated messages," but this criticism is, of course, directed against the telephonic or telegraphic part of the "aerogram" and not the aerial transmission, in which, of course, no mutilation is possible.

He then proceeds to show, under the heading of "Rivals in Speed," that he has "no high opinion of the prospects of the 'aerogram' as a competitor of the cablegram." It is on this point particularly that I differ from him, and it is especially on this point that I have been interested in "aerograms" for a long time after studying the question.

The use of "aerograms" entirely depends, of course, on the Postal Authorities, but the whole idea is linking up the existing telephonic or telegraphic facilities of one country with those of another, using aerial mail in between. Firstly, I think I can prove that the aeroplane is considerably faster than the cable. I think it is a fact beyond dispute that if you handed in a message of 5,000 words to a Cable Company in this country for dispatch to Paris, and at the same moment you handed me a duplicate, my machine would be in Paris before the message had been put through the cable. Secondly, I think I can prove that the aeroplane can carry "words," which is what "Medway" is talking about, much more cheaply than the cable.

In order to be beyond dispute, we will take General Sykes' estimate of weight as carried on a D.H.4 on the London-Paris Service, viz., 6 cwts. Taking 2,000 words to the ounce—and I think this is less than half the number which one could get into an ounce—type-written on thin paper—one arrives at 21,500,000 words, carried from London to Paris, say, in 2¾ hours. Assuming a cost of 10s. a mile, or, £120, the cost is, roughly, 700 words a penny. I am not, of course, suggesting for one moment that this load would always be obtainable, but the fact that the number of words carried in a given time is roughly as above is interesting.

In looking at any idea one has to look at it on large lines to see whether there is anything in the idea at all. "Medway" suggests that in thinking of 'aerograms" I am trying to make the aeroplane do something for which it is not intended, but I think you will give me credit for having, during the last 13 years, done exactly the opposite.

I am not suggesting that at present machines should be devoted to this Service, but I do seriously suggest that if machines were known to be going at a given time, with a load made up of all sorts of matter, that an "aerogram" Service added would be a great benefit to business men living in provincial towns in two such countries as France and England.

G. Holt Thomas.

THE POSSIBILITIES OF AVIATION IN PERU.—II.

(A Paper read before the Royal Aeronautical Society by Squadron-Commander G. M. DYOTT, late R.N).

If owners of properties in these inaccessible districts could once get in their preliminary plant to open their mines and prove their value, money would be forthcoming for building good trails or even railways at a later date. As it stands, capital will not interest itself in undeveloped properties, and owners cannot afford to spend money on trails and wait years for their machinery, hence everything is at a standstill.

To handle work of this kind successfully, aeroplanes of special design would have to be employed. A slow-speed multiple-engine machine with fuselage of large volume would be the best type.

In a general way we may say that carrying freight under abnormal conditions really means exploration and development work. As soon as an industry was well established in a certain district and contact with the outside world became easy then the railway with its cheaper rates would follow with full assurance of procuring sufficient traffic to make it pay.

To make such a scheme successful a complete understanding would have to exist between the aerial transport company and the railway companies, because the former would not agree under normal conditions to open up a district, and, the minute it was beginning to pay well, to have a railway come in and take all the business.

Possibilities for Hydro-Aeroplanes.

The prospects of developing the inland waterways of the country with hydro-aeroplanes are decidedly good. The many tributaries of the Amazon offer natural landing areas over thousands of miles of territory which would cost nothing to prepare or maintain. Launch service on the rivers is slow, uncertain, and at some seasons difficult.

A comprehensive system of hydro-aeroplanes would do wonders to bringing wild and uninhabited regions within easy reach of civilisation. It took the writer nearly a month to go from Iquitos to the Pongo de Manseriche, a distance which a fast hydro-aeroplane could traverse inside five hours. There would be nothing very difficult about starting regular services of this kind—in fact, it would be extremely easy as compared with service in the Sierra, when once a definite plan of action had been decided on. A town like Moyobamba would benefit largely, for although situated on the river Moyo, which is of ample width, it is cut off from all communications with the main river on account of a quarter of a mile of rapids below the town, which is an effective barrier to all launch service. A hydro-aeroplane could fly past this trivial obstruction and thus afford a much-needed outlet to the Huallaga river and thence to Iquitos. As it is, Moyobamba is completely isolated, but for three perilous trails, which are enough to deter the most hardened traveller.

Gold-dredging has been attempted by many companies in the Santiago and Alto Maranon rivers. Each effort has met with failure after spending colossal sums on machinery and strenuous efforts in bringing the equipment up river. Failure has always resulted because adequate communication with civilisation was never maintained. In one case a small but important part of the machinery broke; a canoe was dispatched to Iquitos with the part, but all was lost in the river. After two months waiting another party set out, and after eight months returned only to find the dredge overgrown with vegetation and abandoned by the few remaining men who had not died of fever. Had the company spent £3,000 on a good hydro-aeroplane, they would have been within four hours of Iquitos and able to meet a situation of this kind with great promptness. After all, an expenditure of 2 per cent. on the value of the machinery would not have been an extravagant price to pay.

Equally important as the aeroplanes themselves is the provision of suitable and adequate landing grounds upon which they can alight to take on or discharge their cargo.

On the coast zone the preparation of these would be very easy, as there is hardly a place which could not be turned into a perfect landing ground at a very low cost. On the high puna lands also there are some fine stretches of ground that could be chosen, and the chief expense would be drainage and the erection of a shed to house the machines in when they landed. At slightly lower altitudes some inter-Andean valleys have ideal grounds that could be used with very little preparation. For example, Cajamarca, Huamachuco, and the valley of the Mataro river about Huancayo. In the lower or more abrupt valleys the problem is more difficult, but even here there are a few places that could be utilised.

The most difficult places of all to find good landing grounds would be in the very abrupt valleys or on the shoulders of some of the hills. Small sections of ground would be available in such places, and the solution of the problem would probably be the employment of very slow speed machines that could alight on restricted areas. Machines of this particular kind would only fly short distances and would have to be of special design.

On the wooded eastern slopes of the Andes lying towards Brazil, possible landing grounds would be few and far between until one arrived at the flat ground of the Amazon basin. Even here the cost of making a clearing would be very high, and it could only be done in special cases. Development of this section of the country would be difficult. In the low-lying ground this would not matter, as hydro-aeroplanes would be used, and the rivers themselves would afford the most perfect landing facilities possible.

During the year I spent in travelling through the Andes and the upper reaches of the Amazon I found my daily notes of the wind and weather conditions a source of continual and absorbing interest. In the limits of a paper such as this it is impossible to deal with the subject in anything like an exhaustive manner, but the general results of my observations may be of interest.

Peru can be divided into three territorial zones running more or less parallel with the coast, each one having its own peculiar and distinctive features; they are generally known as the Coast Zone, the Sierra, and the Montana.

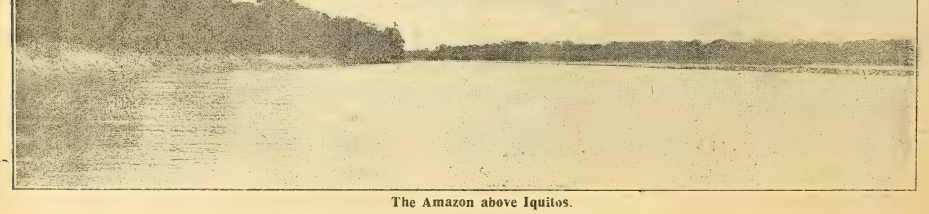
The first, as its name implies, is a belt of country adjacent to the Pacific Ocean. It varies in width from a fraction of a mile up to 10 miles, and is a sandy sterile desert, void of all traces of vegetation except in those localities where artificial irrigation has been practised. It extends inland as far as the foothills of the mountains, at which point we encounter the Sierra, or the great rocky barrier of the Andes, with its abrupt valleys, its towering peaks, and cold, bleak, uninviting uplands.

On the eastern slope of the Andes we enter the Montana or region of woods, with its heavy rainfall, humid heat, and dense virgin forests. Generally it is flat, stretching from the Andes to the eastern border of Peru to the Atlantic seaboard.

Peculiarities of Wind.

It is to be expected that over country of such widely dissimilar nature weather of great variety should occur. What surprised me most was the close proximity of some of these local variations.

There are only two prevailing winds encountered in Northern Peru, which, although varying in intensity, appear to maintain a constant direction within certain well-defined limits. All other winds appeared to me to be purely local and the direct result of sunshine and shadow. The first and most important of these air currents comes sweeping across Brazil from the eastward, laden with moisture drawn up by the action of the sun from the great Amazonian forests; on striking the most easterly ridge of the Andes, the majority of the moisture is precipitated in the form of rain or snow, and the current continues on its way at a height of 14,000 feet and over, finally losing itself somewhere over the Pacific Ocean.



The Amazon above Iquitos.

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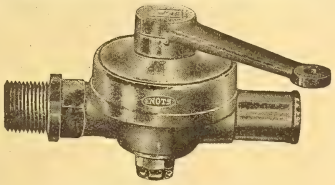
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On keeping close observations of the direction of this wind I noticed that it might occasionally veer round to the north-east or possibly southward to the south-east, but between these limits it seemed to blow with the greatest regularity.

The second prevailing wind is found on the coast, and blows from between south and south-west. It is a cold wind, and, so far as I could judge, a shallow one. On striking the hot sandy coast of Peru it apparently rises to about 6,000 feet, but not more. At times its velocity drops to almost zero, and at other times it may reach as high as 30 miles per hour. Apparently it is steady, but does not extend to any great height as in the case of the easterly wind over the mountains.

For some reason which I could not altogethr understand, clouds in the vicinity of the coast and in the mountains seemed to confine themselves to certain definite strata.

The first of these, particularly noticeable in the coast zone, were found between elevations of 4,000 and 6,000 feet. At some seasons of the year, especially in the last six months, they would assume a lower elevation, extending from the earth's surface to about 4,000 feet. Higher up in the mountains another stratum is encountered between 10,000 and 14,000 feet, and at a still greater altitude a third layer could be observed between 19,000 and 22,000 feet. The low-lying stratum in the coast zone would reach up to a certain altitude and then end abruptly, as if held down by some invisible blanket on top.

When viewed from a high ridge above the cloud line, it resembled a lot of floating seaweed with roots and tentacles stretching downwards to the earth in fantastic form. The strata observed in the mountains, however, seemed to be just as ragged on the upper surface as on the lower.

In the coastal strata I could observe no transfer of air from the clear to the cloud strata, but on two occasions I saw hot air rising locally like boiling water, pushing the clouds out of its way in all directions and leaving an aperture that would gradually close on itself again when the disturbance had ceased. This phenomenon, I think, is unusual, and I am inclined to believe that the lower stratum is actually more dense than the upper one, in spite of the chill imparted to the easterly wind in its passage over the mountains.

Many are under the impression that to cross the Andes involves the passage of but a single ridge, and that it is then a steady descent to the Amazon forest.

Only in one instance can this be done, and that is in the north, where the Andes reach their minimum elevation at Huarmaca. Here one can cross at 7,000 feet, follow the river Huancabamba to Bella Vista, and thence by raft down the Maranon to the region of the woods. All other passages mean crossing at least two and generally four and even six ridges. Between these are found high, bleak puna, or table lands, covered with a coarse grass, or else fertile valleys 8,000 to 12,000 feet above sea level.

Frequently deep narrow valleys are encountered, such as that of the Maranon, into which the sun pours its burning rays, raising the temperature to furnace heat. The deeper valleys are the centre of local winds of a highly interesting nature, and to study them I had to resort to the observation of bird flight and cloud movement.

Bird Aviation.

In 1911 and 1912, when I was flying in Mexico and Central America, I found that the conditions of the atmosphere could be judged very accurately by careful observation of the flight of the turkey-buzzards. These birds are found all over Peru, and between them and the giant condors of the mountains I was able to gather many interesting facts.

The former of these two birds can only maintain flight in calm still air with considerable effort, and they depend on horizontal or vertical air currents to keep aloft for any time.

About eight or nine o'clock in the morning they would leave their resting places and test the air, sometimes giving it up immediately and sometimes losing so much altitude that they would be unable to regain their perch and would have to take refuge on a lower ledge or some dried-up tree in the valley. As soon as conditions for soaring flight prevailed, they would all be circling and circling till lost in the blue. Invariably they seemed to prefer the sides of the valleys, which I took as an indication that they were on the look-out for food; but be this as it may, closer observation showed that the air in the centre of the valley was almost always descending, and it was for that reason that they avoided it. Many times I noticed them glide from one side to the other, and invariably this manœuvre was accompanied by a big loss in altitude.

Towards four-thirty all the heat eddies had stopped, and down would come the turkey-buzzards to roost for the night. Frequently, if their return was postponed till a late hour, their landing on tree-tops was very strenuous, as, unable to support themselves in the falling air, they would fall like a lump of lead on an extending branch and there remain until the morning.

Cloud Observation.

The behaviour of the wind over the mountain tops was of as much interest as the heat eddies in the valleys. Practically all main ridges in Peru run roughly north and south—that is to say, at right angles to the prevailing wind. The eddies set up are therefore the resultant of the east wind and the hot air rising from the valleys. Three distinct effects are noted.

On ridges of 14,000 feet and over, the easterly wind would be so chilled that on passing the ridge it would drop down into the valley, meeting the hot air coming up on the other side. This would cause local disturbance in the atmosphere on the lee side of the summit anywhere from 200 to 1,000 feet down the slope, according to the velocity of the wind and the force of the upward air currents.

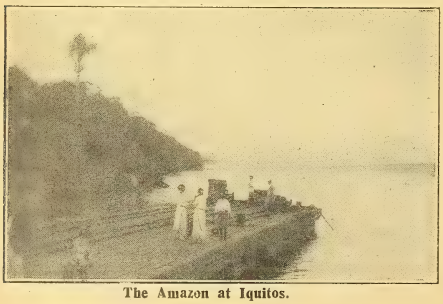
Reversal of wind was not uncommon in cross valleys running up into ridges of this altitude. If the parent valley was narrow and subject to the sun's rays over much of its length, cold air to replace the rising warm air would be drawn from the cross valley. If the head of this valley lay to the east, then down would sweep the clouds till they arrived at a spot where the heat of the sun was enough to disperse them and kill their velocity. One day I counted 11 reversals in 12 hours.

Over lower ridges having an altitude of about 12,000 feet, the heat eddies would, as a rule, prove the strongest, especially along the east coast of the narrow Maranon valley. This was apparent because as the clouds came drifting over from the east they would be folded back on themselves, rolled up, and diverted to a higher elevation. Several times I witnessed collisions between some newly formed cloud as it travelled up a short cross valley and a low straggling one carried before the east wind. The two would meet in a silent crash, sending up a column of whiteness that was marvellous to behold. Reversals of wind in the vicinity of these ridges was not so noticeable as in the higher ones, as the conditions most suitable for the phenomenon were a combination of a short narrow valley running out of a deep hot one up to a high ridge.

On the most easterly chain of the Andes, which is heavily wooded and rises to 5,000 or 6,000 feet, a continuous reversal of wind was frequently noted during the entire day. Undoubtedly this was due to the enormous suction caused by hot air rising from the Amazon woods drawing in the cool air over the mountain tops to replace it. At night this wind would die down, but during the day would attain considerable velocity.

During all my wanderings in the mountains I never once encountered a wind blowing across a valley unless it was the prevailing easterly wind over some high puna land. In all cases local winds blew either up or down the valleys, and it was extremely interesting on some occasions where three valleys united together to observe clouds floating up or down them, sometimes in diametrically opposite directions.

Yet another point was that not only did clouds follow ridges, but they always chose the highest ones for preference. A mass of clouds, for instance, arriving at the head of a valley would as likely as not be split in half, each half following its own side



The Amazon at Iquitos.



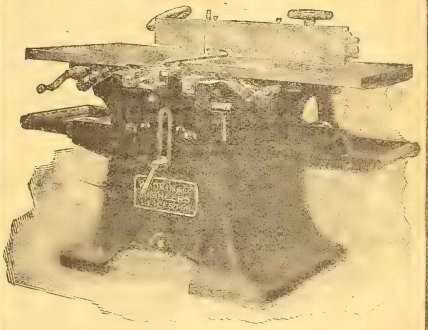
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of the valley. If one side happened to be considerably higher than the other, then the clouds would all veer off to that side

Contrary to general opinion I would not consider the passage of the high ridges to be very difficult. On the other hand, crossing some of these Andean valleys, I feel sure, would be risky with under-powered machines, and after 4 p.m. dangerous.

In closing I would like to make a few remarks in regard to the river Amazon, as I suppose that there is no one who having had experience with seaplanes has not thought about flying up this mammoth river and its many tributaries.

Personally, I would prefer to do the first 2,147 miles as far as Iquitos, the inland port of Peru, in one of the comfortable ocean-going steamers belonging to the Booth Line. This part of the journey can be divided into three sections—Salinas, where a pilot is taken on, to Para 110 miles; Para to Manaos 865 miles, and thence to Iquitos 1,172 miles.

Up to this point the river is so colossal that there is not much pleasure in traversing it even in a 3,000-ton steamer. Its overall width at Iquitos is roughly two miles, the main channel being 850 metres, then an island, and then a more shallow channel of 1,700 metres width.

High-water marks occur in the months of March, April and May, and low-water July, August, September.

From Iquitos to the Pongo de Manseriche there are a few tiny settlements and a small military post at Baranca.

The hydro-aeroplane could alight anywhere along this part without the slightest trouble, but as there are so few habitations, sometimes 100 miles apart, and these only inhabited by half-caste Indians, there would not be much opportunity of trading.

From the Pongo to Bella Vista, a distance of approximately 150 miles, landings on the river could only be made at special points, as there are many gorges and rapids and the water runs with considerable velocity.

In all of this section of the country the idea of providing landing grounds by cutting down the virgin forest is not as easy as is generally supposed. Even if this were done it would need very determined effort to keep the ground clear, as the rapidity with which vegetation grows is enormous.

Beyond Bella Vista the main river is too swift for hydroaeroplane work, but should one have in mind to reach the Pacific Coast it is only a 140 mile journey, and there is but a single low pass of 7,000 feet to be surmounted.

There is no doubt that if, for strategic reasons, rapid aerial transport between Iquitos and the Pacific Coast was essential, then this route would be far the most practical to open up, as that one via the river Pachitea is considerably longer and over a particularly high section of the Andes.

An Indifferent Population.

The greatest difficulty of aerial navigation through the Amazon and its tributaries would be that the population along its banks is so small as to be negligible except in the Ucayali river, Furthermore, the produce of the woods is bulky and awkward to handle. Rubber might offer inducements, but palm fibre, vegetable ivory, timber, etc., are out of consideration for aerial transport. The question of fuel would also be very serious, as at the present time ordinary petrol in Iquitos costs 7s. a gallon, and by the time it had been spread over numerous river depots it would be higher still.

There would be as great opportunities for saving time in the regions of woods as there is in the mountainous districts. The town of Yurimaguas on the Huallaga river is 150 miles away from Iquitos in a direct line, but by canoe or launch the actual distance covered is 450 miles.

People often think of the Amazon as a glorified edition of the Thames, but in reality the only resemblance is that there is water in both. In a previous paragraph I spoke of the value of time as being the all-important factor in the field of commercial aeronautics. If this is applicable in the mountainous districts then it is doubly so in the rivers as here life is very primitive. The unit of time is six months, that is to say, the wet or the less wet season, each of which lasts half a year. The unit of distance is a river bend which varies anywhere between 100 yards up to many miles. All of the inhabitants are poor and the majority underfed, sickly and barely realising that they are alive. Even lower down the river where there are some prosperous planters, to rush them through the air in a few hours to their destination would be to rob them of two weeks of keen enjoyment spent on a river launch, so at the moment one can only look on aerial transport in the Amazon as an adjunct to European enterprise.

The Discussion.

Brig.-General H. R. M. Brooke Popham, C.M.G., D.S.O., A.F.C., R.A.F., said that he considered the lecture one of the most interesting that he had yet heard at the Royal Aeronautical Society's meetings. It was, he thought, of the utmost importance that those connected with the development of aviation should have accurate information as to the physical characteristics of the less well known parts of the earth, such as the lecturer had given, so that they might have a clear idea of both the difficulties to be overcome and the opportunities which exist in such places.

Col. I. B. Davson, R.A.F., congratulated Mr. Dyott on the very interesting lecture. He regretted that no attention had been given to the prospects of aviation in British Guiana.

Here was a territory of over 100,000 sq. miles under British control, very rich in minerals, with rivers giving facilities for seaplane landing equal to those of the Upper Amazon, where the characteristic South American indifference to time and hostility to progress was not to be found.

Capt. A. P. Thurston, R.A.F., said that when war broke out he was himself on a voyage of exploration up the Amazon, and he wished to confirm in every way Mr. Dyott's remarks. His party had explored the upper wind all the way across the Atlantic and up the Amazon by means of pilot balloons.

Over the Amazon the wind was a steady one from the East—generally N.E., but occasionally veering to S.E This wind swept the Amazon itself clear of mosquitoes, but the tributaries were full of them, and, consequently, of fever.

The Amazon was quite a practicable river for seaplanes. At its narrowest (presumably within the navigable portion) it was one mile wide with a nine-knot current.

One point of importance was the effect of the climate upon an aeroplane. No glue and no fabric that he knew of would stand the heat and moisture combined, and the woodwork of an ordinary aeroplane might easily disappear in a single night, thanks to ants and other destructive insects.

The Chairman, General Ruck, entirely agreed with General Brooke Popham as to the importance and interest of the type of paper which they had just heard read.

As far as he was personally concerned the impression which the paper had given him regarding the prospects of commercial aviation in South America was a depressing one.

He had hoped that the lecturer would have pointed out certain possible openings for enterprise, but he had rather emphasised the total absence of any enterprise in the country.

Were there not possibilities in postal services? It looked as though the Amazon might afford a mail route to the Western coast, and if such a mail service were established the country on the route might develop rapidly.

Mr. Dyott's Reply.

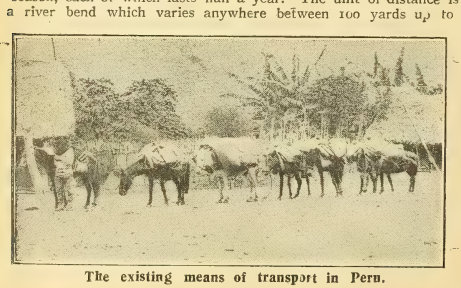
Mr. Dyott said that he had purposely not painted the possibilities in rosy colours. He thought there were commercial possibilities, but there were very great difficulties to be overcome.

There were also certain strategic possibilities.

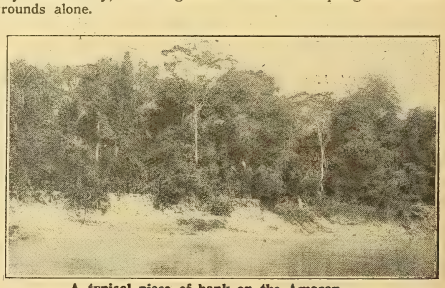
Iquitos was in Peru and was the richest part of Peru. If money were required for paving a street in Lima, that money was obtained by the Government from Iquitos, and Iquitos gained nothing from money so spent.

Consequently, Iquitos did not greatly love Peru, and since Trans-Andean communications were so bad, Peru might have grave difficulties in keeping its hold on this district

Aerial transport across the Andes would assist the Government very considerably, and might be worth attempting on these grounds alone.



The existing means of transport in Peru.



A typical piece of bank on the Amazon.

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CIVIL AERIAL TRANSPORT NOTES.

United Kingdom.

The following cross-country flights were made from Hounslow during the week ending June 14th :—One to Folkestone and return. Two to Southampton and Southsea and return. One to Liverpool and return. One to Broadstairs and return.

South Africa.

A commercial aviation company, with an initial capital of £100,000, has been started at Johannesburg. Services will be run at the end of the year between Johannesburg, Pretoria, Maritzburg, and Durban.

The largest machine will carry 24 passengers and about 500 lb. weight of parcels. The fare from Johannesburg to Durban, as far as can be estimated at present, will be about £10, and the parcel rate 1s. per lb. As soon as regular services are in operation the company will tender for the carriage of mails.

The following are comparisons of the times taken respectively by train and estimated to be taken by aeroplane between various towns.

	By Train.	By Air.
Capetown to Pretoria, 1,001 miles	47¾hr.	9hr.
Durban to Pretoria, 519 miles	24hr.	4hr.
Pretoria to Johannesburg, 39 miles	80min.	30min.
Bloemfontein to Johannesburg, 290 miles	11¼hr.	3¼hr.

A flying school is about to be opened in Johannesburg, the course lasting about six weeks, and including 20 hours' solo flying, ground instruction, care and maintenance of aircraft, map-reading, cross-country flying, and aerial navigation.

Canada.

A new aeronautical company, known as the Bishop-Barker Aviation Co., Ltd., has just been registered. Among the directors are Lieut.-Cols. Barker, V.C., and Bishop, V.C. They intend to carry on business principally in Canada and the U.S.A.

Brazil.

The Brazilian Minister of Transport has instructed the Department of Maritime and River Transport to study the conditions of aerial transport in order to draw up regulations regarding aerial navigation in Brazil.

It is reported that an Italian-Brazilian company has been formed for the purpose of establishing aerial communications in Brazil, and have entered into negotiations for concessions to that end from the Ministry of Transport.

It is proposed to commence with a service between Rio Grande and Porto Alegre.

The machines to be used will be Caproni seaplanes—"much less perilous than aeroplanes," as the Brazilian paper puts it.

Concessions have been granted by the Brazilian Government to:

Senors Joao Lexeira Soares and Antonio Rossi to institute aerial transport services between the principal cities of Brazil. (Decree No. 13,244, Oct. 23rd, 1918.)

Senors Joao Baptista dos Santos and Augusto de Aranjo Goes to use aerial means of transport—including seaplanes for the transport of passengers and goods in Brazil. (Decree No. 13,504, March 12th, 1919.)

A HANDLEY PAGE ENTERPRISE IN BRAZIL.

According to "Auto-Propulsao" (Rio de Janeiro) of May 1st, one of the first commercial air services likely to be established in South America is that projected by Handley Page, Ltd., who, through their representatives, Major Ivor Bellairs and Mr. W. Douglas, are seeking from the Brazilian Government certain concessions to that end.

These same gentlemen are to make a journey which is to include Chili and the Argentine, with the object of obtaining similar concessions in these countries.

It is proposed to establish a service between Pernambuco and Buenos Aires.

It is suggested that either an all day and night taking 44 hrs. 30 mins. start to stop, or a service flying by day only, and taking three days and a quarter could be run over the route.

The following tables give suggested time tables :—

DAY AND NIGHT SERVICE.

Stage.	Hours' flight.	Miles.	Depart.	Arrive.
Buenos Aires-Montevideo	1¾	120	2.0 p.m.	3.45 p.m.
Montevideo-Rio Grande	5	345	4.45 p.m.	10.0 p.m.
Rio Grande-Porto Alegre	2½	160	11.0 p.m.	1.15 p.m.
Porto Alegre-Florianopolis	3½	250	1.45 a.m.	5.15 a.m.
Florianopolis-Santos	4½	320	5.45 a.m.	10.15 a.m.
Santos-Rio	3	220	10.45 a.m.	1.45 p.m.
Rio-Victoria	3½	250	2.15 p.m.	5.45 p.m.
Victoria-Carvellas	3	220	6.15 p.m.	9.15 p.m.
Carvellas-Bahia	5½	390	9.45 p.m.	3.15 a.m.
Bahia-Maceio	4½	320	3.45 a.m.	8.15 a.m.
Maceio-Pernambuco	1¾	130	8.45 a.m.	10.30 a.m.
Total	38½	2,725		

DAY ONLY SERVICE.

Stage.	Hours' Flight Miles.	Depart.	Arrive.
Buenos Aires-Montevideo	1¾	6.30 a.m.	8.15 a.m.
Montevideo-Rio Grande	5	9.15 a.m.	2.15 p.m.
Rio Grande-Porto Alegre	2½	3.15 p.m.	5.30 p.m.
FIRST DAY	9 hrs.—625 miles		
Porto Alegre-Florianopolis	3½	6.0 a.m.	9.30 a.m.
Florianopolis-Santos	4½	10.0 a.m.	2.30 p.m.
Santos-Rio	3	3.0 p.m.	6.0 p.m.
SECOND DAY	11 hrs.—790 miles.		
Rio-Victoria	3½	6.0 a.m.	9.30 a.m.
Victoria-Carvellas	3	10.0 a.m.	1.0 p.m.
Carvellas-Bahia	5½	1.30 p.m.	7.0 p.m.
THIRD DAY	12 hrs.—860 miles		
Bahia-Maceio	4½	6.0 a.m.	10.30 a.m.
Maceio-Pernambuco	1¾	11.0 a.m.	12.45 p.m.
LAST DAY	6¼ hrs.—450 miles.		

Major Bellairs and Mr. Douglas are stated to have expressed themselves enthusiastically as to the prospects of commercial aviation in Brazil, particularly in regard to the excellent weather conditions in South America.

FROM SEAPLANES TO RIVER BOATS.

Messrs. Short Bros. have turned over a large part of their works at Rochester, Kent, for the mass manufacture of standardised types of river craft, from Canadian canoes to power-launches.

A USEFUL SIDE-LINE.

By way of keeping the shops busy pending the development of Civil Aviation, the Supermarine Aviation Works, Ltd., of Southampton, are re-opening their motor-boat and launch department in continuation of their pre-war practice.

This department has been considerably enlarged and equipped on the most modern lines. The experience gained by the firm in building flying-boats has naturally taught them much which can be applied to the improvement of motor-boats and launches, and, therefore, these products of the firm may be regarded as in the very first class.

Two types are being manufactured, both of 25 ft. length by 5 ft. 8 in. beam, and maximum 2 ft. draught, with a speed of about 11 knots. The first is of the yacht's pinnace type, whereas the other is of the All-Weather Sea-Going type intended for the use of the owner-helmsman. The engine fitted in each type is the Thornycroft A/B4 type of 25-30 h.p.

Firms who intend to run a seaplane service, which naturally necessitates keeping a motor-boat as a tender to the seaplanes, would do well to get in touch with the Supermarine Company and investigate these launches in detail.

ACTIVITIES AT CHELTENHAM.

Major-Gen. Sir Sefton Brancker, K.C.B., in an Airco 9, visited Cheltenham recently to inspect an aerodrome in the vicinity.

Also during the last few days a former habitué of Hendon, Major E. Prosser, late of the Australian Flying Corps, and formerly of Hendon, and one of the first English aviators, flew from Bournemouth to Cheltenham, accompanied by Mr G. H. Bettinson, in a 70-h.p. Caudron biplane, and after a day's halt to look round the aerodrome at Badgeworth the machine was flown back to Bournemouth, this time taking as passenger Sec. Lieut. R. R. H. Bruce, late R.A.F., one of the Cheltenham School staff pilots.

It is understood that efforts are being made to organise a "Cheltenham Aviation Week" and a regular "joy-ride" service during the season for carrying passengers. A fleet of specially-adapted and equipped fast machines will also be available shortly for business and express requirements.

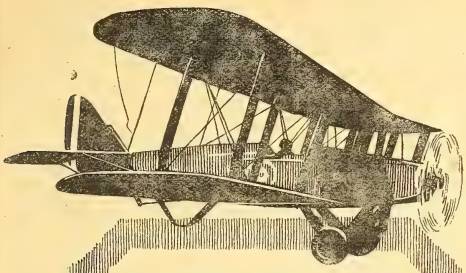
The aerodrome at Badgeworth is now completed, and is suitably situated to accommodate the air traffic of the two circular air lines which, it is hoped, will be operated from this base.

A flying club is also being formed, which will place at the disposal of qualified fliers and others the facilities of a completely equipped aerodrome, with garage accommodation for privately-owned machines, combined with the conveniences of a modern club-house.

The entire enterprise is being organised by Lieut. Horace C. Wright, who had considerable pre-war experience as an aeroplane pilot, and who has recently been demobilised from the Royal Air Force.

TO BUYERS OF "SALVAGE" AIRCRAFT.

Purchasers or intending purchasers of "salved" aeroplanes and spares who do not feel themselves competent to judge of the condition of the fabric and dope on their purchases should note that Aero Coverings, Ltd., of Tennyson Works, Willesden Lane, London, N.W.6, are prepared not only to advise upon the subject, but to collect, re-cover, re-dope, and finish to any required scheme and re-deliver wings and the like in a very short time.



Aeroplane Equipment.

Manufacturers interested in specialised Trunks, Valises, Tool Cases, etc., for Aeroplanes, should forward enquiries to J. B. BROOKS & Co., Ltd., makers of the well-known

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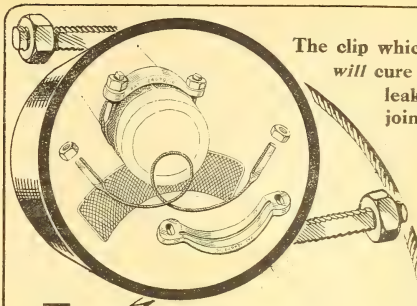
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AIRCRAFT FINANCE

NATIONALISATION AND AVIATION.

History is frequently dull, but usually instructive and sometimes helpful, and when one considers the past experience of the railways of this country in conjunction with the present agitation for nationalisation the question of the degree of intimacy between the Government and the newer phase of transportation facilities forces itself out rather prominently.

The Imperfections of the Railways.

Take, to begin with, the contemplated aerial postal and mail services. Admittedly the State has devised some regulations bearing upon the conduct of aviation, but that is a mere detail. The point is that no one wants all the faults of the railway system to be repeated in the aerial services of the future. This being so, would it not be prudent for the State to act now right at the beginning before anything savouring of vested interest—that imaginary evil so strongly anathematised by every type of social reformer—is created?

Ineradicable.

Judged as an effective section of the transportation organisation, the railways are anything but good now. Before the war they did not approach perfection, either physically or economically. Some of the imperfections were acquired at birth; some are the result of faulty principles of operation; many are ineradicable; others might be eliminated at a cost which could not be undertaken.

Private Enterprise Is Imperative.

Admittedly, if the development of the newer business of aviation transport were dependent upon a Government, there would not be much progress on the right and proper lines calculated to produce efficiency coupled with permanency. This scarcely calls for contradiction. When the State assumes control, if brains do not run off to a discount, it is indisputable that the expense ratio is absurdly high, and economically the results are not equal to those of private enterprise, nor are the physical results so good.

A Passive Interest for the State.

Therefore it is necessary that private enterprise alone should be responsible for the development of commercial aviation without any interference on the part of the State. But in these days of communalism—in the abstract—it would be advantageous if some means could be devised whereby the State acquires some interest in the project. It would be discreet, possibly helpful without being a drawback. The man in the street would be protected because he would have an indirect interest.

The Possible Disadvantages.

There are many who argue that, no matter how small and passive the State interest was, the possibilities would be seriously menacing and perhaps pernicious. The State would, they fear, exceed its privileges. The politicians, the amateur statesmen, might suffer from brain-storms, to the detriment of aviation. One knows what this means. It is not pleasant to contemplate.

But the advantages might outweigh the disadvantages in a properly conceived scheme, and the matter should be regarded in this way. A great deal, of course, would depend upon the elaboration of the scheme. The interests of the State would have to be protected. It is equally true that the interests of private enterprise would have to be protected at the same time.

The Point of View of the Public.

If the position of the State, as custodians of the rights and privileges of the public were properly defined, and if, as satisfaction for the sacrifice of a part of its independence, private enterprise received some small compensation, there would be an incentive to development, to progress, and to efficiency. But private enterprise must not be curbed or annoyed by the State usurping its defined privileges.

The Parallel of Shipping Subsidies.

There are countless objections but many advantages to both parties. The subsidisation of shipping services is common enough, but if the same principle is followed out in the case of aviation it need not necessarily be carried out on exactly the same lines. As a matter of fact, a direct subsidy might not prove the perfection of human ingenuity in the special case of aviation. In the present phase of aeronautical science it might stultify rather than stimulate. Progress as rapid as is consistent with physical and economic efficiency is called for.

Already the nucleus of a possible scheme for a Government partnership exists.

W. J. Davies.

CURRENT TOPICS.

The Financial World Idle.

The great idea in the Financial World generally now is to get the big Funding Loan out of the way as speedily as possible so that business can be taken in hand seriously. It is like a dose of physic, nasty to the palate but good for the system. The greater the success it proves the better for the country at large.

Aircraft Shares are Sliding.

In the meantime, the Stock Exchange is not blessed with much business, and domestic securities provide little of especial interest. Aircraft Manufacturing shares have been drooping with the "B" Preference no better than 18s. This is due to apprehension of the immediate future of the Industry. There is moderate support for Rolls-Royce, and the new Handley Page Participating Preference are being dealt in at 17s. 6d. to 18s. 3d. Whiteheads 10 per cent. Participating Ordinary are scarcely better than 4s. 3d. Some people are wondering what they should do with the shares: sell them or hold on in the hope of the company improving its position? It is difficult to probe the future.

Sopwith in Australia.

The registration of an Australian auxiliary of Sopwiths is interesting. The name is the Larkin-Sopwith Aviation Co. of Australia, and the nominal capital is £31,500 in 30,000 £1 preference shares and 30,000 deferred ordinary shares of sixpence each. The first directors—all permanent—are H. B. Larkin, R. J. Turner, and J. T. Leete, all permanent directors, too. The sixpenny deferred shares are not exactly a novelty but they are uncommon. In time, one will probably hear of penny shares!

Some New Ventures.

There is nothing exceptional about a new company that intends to combine the business of cabinetmakers and the manufacture of aeroplanes, like one just detailed at Somerset House, but Transport International, Ltd., which has been formed with a nominal capital of £1,000 in £1 shares to operate postal, passenger and freight services strikes the fancy. Evidently, it is purely the registration of the name.

The Spanish Mail Scheme.

By the way, one awaits with expectancy the report and findings of the Commission nominated by the Postmaster-General of Spain for the purpose of studying the question of an aerial post. There are to be given some estimates of cost, etc., etc., which should be instructive from several aspects. Spain has been enriched sufficiently by the war to do a lot in aviation.

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Fonck — 29,530 feet

He is going to attempt a climb to over 10,500 metres. Lumiere propeller.

Casale — 30,510 feet

Climbed in 41 mins. on May 28th with a 300 h.p. Nieuport 29, and raised the world's record to nearly 10,000 metres with the same machine on June 7th. Lumiere propeller.

Sadi-Lecointe — 29.200 feet

Flying a 300 h.p. Spad made the previous record on May 19th, also used a Lumiere propeller.

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AIRCRAFT IN PARLIAMENT

COMPENSATION FOR DAMAGE BY AEROPLANES.

Notice of the following question had been given by Sir PHILIP MAGNUS on June 2nd:—

To ask the President of the Board of Trade whether he is considering the measures necessary to provide compensation for damage to private property or loss of life caused by any kind of aeroplane, whether in use for commercial, experimental, or other objects.

Sir P. MAGNUS: I put this question down on Wednesday, and transferred it to this day. On Thursday I saw the answer to it in the "Times" newspaper. I propose to put some supplementary questions on some other day.

* * *

The following oral answers were given on June 2nd:—

ROYAL AIR FORCE.—LIGHTER-THAN-AIR SERVICE.

Captain W. BENN asked the Under Secretary of State to the Air Ministry whether he can make a statement about the future organisation of the lighter-than-air branch of the Air Service.

The UNDER SECRETARY of STATE for AIR (Major-Gen. Seely): Proposals to transfer the responsibility for airship construction from the Admiralty to the Air Ministry are now under discussion between the two Departments. I think it would be inadvisable to make any further announcement at present, but I will do so as soon as details have been arranged.

OBSOLESCENT AIRCRAFT (CONTRACTS).

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry whether he will state what contracts for obsolete or obsolescent aircraft remained uncancelled; and the date when it may be anticipated that these contracts will be concluded.

Mr. KELLAWAY: All contracts for obsolete and obsolescent aircraft are now concluded.

TARRANT TRIPLANE.

Captain ORMSBY-GORE asked the Under Secretary of State to the Air Ministry whether he will publish a Report on the causes and circumstances of the failure on trial of the Tarrant triplane at Farnborough, which resulted in the loss of the lives of two officers of the Air Force.

Major-Gen. SEELY: The Tarrant triplane was built for military purposes to the order of the Government, and it would not be in the interests of the public service for the results of a technical investigation into the causes of the accident to be published.

GENERAL SYKES' STAFF.

Mr. RAPER asked the Under Secretary of State to the Air Ministry if he will state what is the total amount of money per annum being allocated for the payment of General Sykes' staff; whether there are any restrictions as regards maximum salaries to be paid to his staff, and, if so, what; and what are the exact terms under which the assistants in General Sykes' department are engaged so far as duration and termination of agreement are concerned.

Major-Gen. SEELY: Proposals as to the staff required by General Sykes for his department have been laid before the Treasury, and until the Treasury decision has been received I am unable to answer the questions raised.

* * *

The following written answer was given on June 2nd:—

ROYAL AIR FORCE.—SEC. LIEUT. J. R. FOX (DEATH).

Major NALL asked the Under Secretary of State to the Air Ministry why Second Lieutenant J. B. Fox, Royal Air Force, has not been officially reported killed, although ample evidence is available that he died from wounds on August 19th, 1918, at Ingweiler, and was buried in the Ingweiler Cemetery.

Major-Gen. SEELY: The question doubtless refers to Second Lieutenant J. R. Fox, 10th Manchester Regiment and Royal Air Force, who was reported missing on August 16th, 1918. This officer's death has been accepted for official purposes as having occurred on or since 16-8-18, and a letter to that effect was sent to the next of kin on 30-4-19.

* * *

The following oral answers were given on June 3rd:—

AERODROME CONTRACTORS (MOTOR LORRY).

Mr. HUGH MORRISON asked the Secretary for War whether he is aware that, in spite of the representations of the Salisbury Rural District Council to the road transport officer of the Southern Command, the Royal Air Force are using a three-ton lorry for the purpose of conveying about four persons each day from Winterslow to Lopcombe Corner Aerodrome, and that in consequence considerable damage is being done to the roads in the district by this unnecessary heavy military traffic; and will he take steps to stop this waste of money.

Mr. CHURCHILL: The lorry in question belongs to the contractors working at Lopcombe Corner Aerodrome, and is used for the conveyance of stores and workmen to and from the station. There are generally about sixteen men, while the stores consist mainly of drain pipes, for which a conveyance of this kind is necessary.

MISS DOUGLAS-PENNANT.

Sir R. THOMAS (*by private notice*) asked the Leader of the House whether the Government are now prepared, in view of what occurred in the other House last week, to agree to set up a Committee of Inquiry in respect of Miss Douglas-Pennant's dismissal.

Mr. BONAR LAW: I think it only right, in view of the Resolution in another place, that the subject should be considered by the Cabinet. It has not been possible to do so to-day, on account of the pressure of more important work, but if my hon. friend will put down a question to-morrow or Thursday, I hope to be able to give him a definite answer.

Sir R. THOMAS: I will do that, Mr. Speaker.

* * *

The following written answers were given on June 3rd:—

ROYAL AIR FORCE.—SERVICE FUNERALS.

Lieut.-Col. MALONE asked the Under Secretary of State to the Air Ministry whether officers, on transference from the Royal Naval Air Service to the Royal Air Force, lose their right to a Service funeral unless death is due to a flying accident; whether this is contrary to Air Force Memorandum No. 1, Paragraphs 6 and 7, which provides that no financial loss should be incurred on transference; and whether he will have inquiries made in the case of Second Lieutenant A. W. Benfield, who transferred from the Royal Naval Air Service to the Royal Air Force died in hospital at Norwich last November, and whose funeral expenses are still unpaid owing to the refusal of the Air Ministry to allow the same and the fact that the next-of-kin are not in a financial position to meet the obligation.

Major-Gen. SEELY: Officers of the Royal Air Force who die in this country are not entitled to a funeral at the public expense unless they are killed as the result of a flying accident. This rule applies equally to officers transferred from the Royal Naval Air Service as to those transferred from the Royal Flying Corps, and, as my hon. and gallant friend will appreciate, no discrimination could be made in this matter between the two classes. As regards the particular case of the late Second Lieutenant Benfield, I shall be glad to consider whether an ex gratia allowance can be made towards the funeral expenses, if my hon. and gallant friend will furnish me with information as to the financial circumstances of the deceased officer's next-of-kin.

AEROPLANES (SALE).

Lieut.-Col. Sir S. HOARE asked the Parliamentary Secretary to the Minister of Munitions whether, in view of the high prices now being realised for obsolete and old motor-cycles and cars being sold by Government Departments, it would be desirable to offer some of the new aeroplanes, now being broken up, to the public by auction sale so as to test the market on this matter.

Mr. KELLAWAY: No aeroplanes have been broken up by the Disposal Board except those which have been declared by the Air Ministry to be obsolete for Service use and unsuitable for civil aviation, and such machines as, by reason of their condition, could not be made safe for flying without unprofitable expenditure. The Disposal Board is offering aeroplanes and engines to the public by the various recognised methods of sale, including sale by auction. An auction sale was held at Hendon yesterday, after having been widely advertised for the past two weeks.

ROYAL AIR FORCE (ROBERT DAVIDSON).

Mr. NEIL MACLEAN asked the Secretary of State for War whether he was aware that Robert Davidson, No. 220282, L.A.S., Royal Air Force, was demobilised on March 8th, 1919, after four years and three months' service, and although due, approximately, £40 balance of pay and £26 gratuity, has received nothing, and, as a consequence, had to enlist again for two years on April 8th, 1919; if he is aware that he has allotted £6 18s. per week, with allowance, should enable his wife to £2 1s. per week, but that she has received nothing; if he is aware that the paymaster at Woking has been written to and interviewed, but nothing has been done; and whether he proposes to take any steps to secure to this soldier and his family the money and leave to which he and they are entitled.

Major-Gen. SEELY: I think the hon. Member must be referring to No. 229282, and not 220282 Leading Air Mechanic Robert Davidson. The sum due to this man on dispersal was, I find, not £40, but £5 18s. 6d., and this has been paid, with the exception of 6d. deducted for National Health Insurance. A complete statement of the man's account is being sent to his commanding officer for the man's information. The gratuity payable amounted to £25. Of this £24 was deposited with the Post Office Savings Bank on June 1st. The remaining £1 would have been issued on the return by the man of his overcoat. The money allotted by Davidson on re-enlistment and separation allowance I have, I am informed, now been issued, with arrears to the date of re-enlistment. The man will receive any leave to which he is entitled.

* * *

The following question was answered on Monday last, but a copy of the reply was not received in time for inclusion in the Official Report of that day's Proceedings:—

ROYAL AIR FORCE.—OFFICERS (TECHNICAL PAY).

Lieut.-Col. Sir F. HALL asked the Under Secretary of State to the Air Ministry whether any decision has yet been arrived at as to awarding technical pay to officers in Category B of the Royal Air Force; whether their duties are of less importance than those of the officers in Category A; and whether, when a decision is arrived at, in the event of it not already having been reached, emoluments will be made retrospective to temporary officers as and from the date of the Air Ministry Order of September 26th, 1918.

Major-Gen. SEELY: The matter has been very carefully considered, and it has been decided not to award technical pay generally to officers in Category B, as their duties do not involve the same standard of technical knowledge as those of officers in Category A.

Sir F. HALL: Is it not the case that the duties which attach to officers in Category A include the instruction of fire appliances and sewing of gas balloons, whereas in Category B it is necessary for officers to be well up in armaments and chemistry, and why are they treated on the same lines?

Major-Gen. SEELY: This is a highly technical matter on which we might spend a quarter of an hour in arguing together. I shall be glad to write to my hon. friend.

* * *

The following oral answers were given on June 4th:—

AFGHAN TOWNS (BOMBING).

Lieut.-Commdr. KENWORTHY asked the Secretary of State for India if day and night aeroplane bombing raids have been carried out against Jellalabad and other Afghan towns; if so, what steps are taken to avoid the killing of women and children in these raids; and will he publish assurances on this subject for the information of the Moslem subjects of the Empire and of our allies.

Colonel WEDGWOOD asked the Secretary of State for War whether any and, if so, what instructions have been given as to the bombing of Afghan towns and villages with a view to prevent injury to non-combatants.

The SECRETARY of STATE for INDIA (Mr. Montagu): As far as is known, aeroplane bombing raids on Afghan towns have been solely by day, I have ascertained from the Viceroy that all possible care is taken to confine operations to attacks on troops and military objectives and to avoid villages and other unfortified places. British military practice in this respect is sufficiently known to make a public announcement on the subject unnecessary.

Lieut.-Commdr. KENWORTHY: Are any instructions given as to the height from which bombs are to be dropped in the day time?

Mr. MONTAGU: No.

[One wonders whether Lieut.-Comdr. Kenworthy and Col. Wedgwood have ever seen that verse of Mr. Kipling's which runs:—

> "When you're wounded and left on Afghanistan's plains
> And the women come out to cut up what remains,
> Just roll to your rifle and blow out your brains
> And go to your God like a soldier"]

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THE AERIAL DERBY.

At 5.54 p.m. on Monday, June 16th, a telegram was received by the officials of the London Aerodrome, Hendon, from Captain Alcock, entering his name for next Saturday's Aerial Derby.

It is hoped that the chassis of Captain Alcock's Atlantic machine will be repaired in time for this to take part in the contest, otherwise he will probably fly another Vickers machine.

Captain Alcock will be accompanied by his Atlantic navigator Lieut. Brown in the observer's seat.

The entry list is as follows :—

1. Clifford B. Prodger. B.A.T. "Bantam." 170-h.p. A.B.C. "Wasp." 120 m.p.h.
2. Captain P. R. T. Chamberlayne. Grahame-White "Bantam." 80-h.p. Le Rhône. 90 m.p.h.
3. Major C. Draper, D.S.O. B.A.T. (Sporting two-seater). 200-h.p. A.B.C. "Wasp II." 125 m.p.h.
4. Lt.-Col. G. L. P. Henderson, A.F.C., M.C. Martinsyde "F.4." 250-h.p. Rolls-Royce "Falcon II". 145 m.p.h.
5. Major R. H. Carr, A.F.C., D.C.M. Grahame-White "Bantam." 80-h.p. Le Rhône. 90 m.p.h.
7. Capt. G. Gathergood, A.F.C. Airco "R.4." 450-h.p. Napier "Lion." 140 m.p.h.
8. Marcus D. Manton. Airco "4." 375-h.p. Rolls-Royce "Eagle VIII." 130 m.p.h.
9. Capt. H. J. Saint, D.S.O. Airco "9" (three-seater). 240-h.p. Siddeley "Puma." 111 m.p.h.
10. Lieut. Robert Nisbet. Martinsyde "F.4." 275-h.p. Rolls-Royce "Falcon III." 144 m.p.h.
11. Major L. R. Tait-Cox. Nieuport "L.C.1." 320-h.p. A.B.C. "Dragonfly." 143 m.p.h.
12. Major C. H. C. Smith, D.S.O. Bristol Monoplane. 110-h.p. Le Rhône. 110 m.p.h.
14. Capt. .H. A. Hammersley. Avro "Baby." 35-h.p. Green. 70 m.p.h.
15. Lieut. C. Turner, A.F.C. B.A.T. "Commercial" (five-seater). 375-h.p. Rolls-Royce "Eagle VIII." 115 m.p.h.
16. Capt. C. R. Vaughan. B.A.T. "Bantam." 170-h.p. A.B.C. "Wasp." 120 m.p.h.
17. H. G. Hawker. Sopwith. To be announced later.
18. Capt. J. Alcock, D.S.O. Vickers. To be announced later.

All pilots whose rank is shown are ex-Royal Air Force Officers.

All pilots are British, with the exception of Mr. C. B. Prodger (No. 1), who is an American.

All machines are biplanes, except No. 12 (Major Smith), which is a monoplane.

The course is a double circuit of London, a distance, approximately, of 190 miles, with six turning points, i.e., Kempton Park, Epsom, West Thurrock, Epping, Hertford and Hendon.

The airmen leave The London Aerodrome, Hendon, at 3.30 p.m., and after completing the first lap will again pass over the Aerodrome, entering the second circuit at about 4.10 p.m., the winner being expected to cross the finishing line soon after 4.45 p.m.

Each aeroplane will have its official number boldly displayed on the under surface of the bottom planes, on the upper surface of the top planes, and on both sides of the rudder, which will enable the public at the turning points to identify them.

The enclosures at The London Aerodrome, Hendon, where the start and finish take place, are being enlarged, and special traffic and catering arrangements are being made.

IMPROVING THE LONDON AERODROME.

The following letter has been received :—

Sir,—My attention having been drawn to your article in the current issue of your journal, I beg to express to you on behalf of this company my appreciation of the interest you evince in the future success of the London Aerodrome. I thank you for the criticisms and suggestions which you so kindly give, and note the allowance which you are prepared to make on account of the continued Government occupation and control of the aerodrome, which indicates that you recognise how embarrassing such circumstances are to our business.

As to the colour of the company's aeroplanes; colours, it may be agreed, are matters of taste, good or otherwise, in cases where they are for artistic effect only, but it evidently has not occurred to you that colour in this case has more utility from the practical point of view, as a means of easy identification in the air, and the comparison you draw as between the colour which offends your taste and the dressings of the aeroplanes for war purposes is obviously beside the point.

As to "Mr. Chamberlayne's dashing career on the Grahame-White single-seater," this machine was, I believe, specially designed with abnormal side surfaces, as Capt. Chamberlayne is anxious to demonstrate that aeroplanes can be flown sideways as well as forwards, backwards, and upside down.

With reference to the race on Saturday the 7th inst., I regret that the direction of the wind made it necessary for the machines to take off from the position they did. Perhaps in future you would prefer them to take off with the wind on the beam, but in any case I shall be glad of your further suggestions and advice.

[In the pre-war days machines started on the starting line no matter which way the wind blew. But there were pilots in those days.—Ed.

The handicapping evidently did not meet with your approval, and in this connection no doubt the Officials of the Royal Aero Club would welcome your valuable technical advice in this by no means easy task. I would, however, bring to your notice the fact that the handicapping was in the hands of one, if not two, of the most experienced Aircraft handicappers in this country, but in view of the lapse of five years since the last Aeroplane race, it is not surprising that the relative speeds of machines of such totally different construction could not very accurately be estimated. I believe that it took several years in pre-war days to obtain close finishes in handicaps.

As the race in question was "point to point," and the turning points were clearly indicated on the Aerodrome by a pylon and two white sheets, and at Bitterey Hill by a large brick building, surely no further pylons were absolutely necessary.

Regarding the Air Ministry's Regulations governing civilian flying, I would point out that, until my Company is again in control of the London Aerodrome, they have no power to enforce any regulations, as the entire flying area is still in the absolute control of the Officer in Charge of the Hendon Aircraft Acceptance Park.

I can assure you that it is the desire no less of my Directors than of yourself to maintain Hendon and the London Aerodrome as the hub of British Aviation, and to strengthen and consolidate the premier position which it undoubtedly held in pre-war days, but this unfortunately will only be possible when the Company obtains full and unrestricted use of its unique facilities, and is not bound and fettered, as it now is, in every step it desires to take.

Your suggestion of my Company acquiring certain Government aircraft, as you will doubtless be surprised to learn, already occurred to my directors, and active steps have long since been taken in this direction, but in view of your own often expressed opinion regarding the rapidity of obtaining Government decisions, you will not, I am sure, regard the position as hopeless. On inquiry, however, you will ascertain that certain of the machines mentioned by you *are not for sale*, being considered by the department concerned both obsolete and dangerous.

As to the course for the races, as soon as permission can be obtained for the necessary pylons to be erected, the races will be conducted in such a manner as to afford the best possible view of the machines with the least possible danger to the public, as was our custom in the days when we were able to organise and carry our arrangements into effect without "let or hindrance."

At the present time my Company has not sufficient accommodation for its own machines, and it will only be possible to meet all the demands for shed accommodation and flying facilities which we have already received from the Aircraft Industry when, as already stated, the Government relinquish their occupation of the Company's property.

As to the best, soundest and most convenient and satisfactory method of running the London Aerodrome, whilst noting your remarks, this is a matter which I think can safely be left to the judgment and discretion of my directors, who have with no small amount of courage, determination and foresight, brought this pioneer British Aircraft enterprise through some very lean and difficult periods, when I believe neither you nor the bulk of the British public had much faith in the future of aeronautics, and at a time when it was well nigh impossible to obtain any financial support for the industry.

[If one had not had faith in the future of aeronautics long before Hendon was heard of one would not be here now.—Ed.]

There is plenty of room for other aerodromes around London, and your pessimistic fears regarding the future of the London Aerodrome are, I hope, without any real foundation.

However, "time will prove," and with your valuable and wholesome criticism and suggestions always at hand, the success of the London Aerodrome in the future is, I hope, assured.

(Signed) H. E. Hutchins, Secretary.

[One is glad to have this reply to the friendly criticisms published in The Aeroplane. It shows that Hendon is properly conscious of its own defects.—Ed.]

THE AIRCRAFT DISPOSAL BOARD.

The Aircraft Disposal Board has been selling recently large quantities of cars, motor-cycles, etc., at the Agricultural Hall, Islington. Near the main entrance there is a representative show of aircraft and accessories which attracts much interest. The bulk of the aircraft stores for disposal are at Hendon and Waddon (near Croydon), and permission to view may be obtained from the Controller, Disposal Dept., Kingsway, W.C.2.

THE TRANS-ATLANTIC COMPETITION.

The Atlantic has at last been crossed by direct flight from Newfoundland to Ireland. Two attempts only have been made, the first of which ended halfway across, after a flight in which the navigation was singularly skilful and accurate. At the second attempt the prize was won. This rapid success is symbolic of the advance made in aeronautics during the years of the war.

On June 14th at 4.28 p.m., Greenwich mean time, Captain John Alcock, D.S.C., R.A.F., and Lieut. Whitten Brown, R.A.F., flying a Vickers "Vimy" biplane (two 375 h.p. Rolls-Royce engines), left ground near St. John's Newfoundland, and landed 16 hrs. 12 mins. later (8.40 a.m., G.M.T.) on the following morning at Clifden, Co. Galway. Unfortunately, in landing, the machine ran into a bog and turned onto its nose and was consequently somewhat seriously damaged. The landing was made in rain and mist. The machine left Newfoundland with about 3½ tons of petrol on board.

The following is extracted from a "Daily Mail" interview with Captain Alcock on June 15th :—

"We landed," he said, "in the softest part of Ireland, but really it is a wonder we ever got here, for our wireless was cut of action. Within half an hour of starting the armature arm connected to the propeller of the wireless set sheered completely off.

"We started at 5.13 p.m., summer time. The weather reports were very good, and for the first hour the conditions were excellent. We passed Signal Hill at 5.28. We crossed the coast of Ireland at 9.25 a.m. to-day after a flight of 15 hours 57 minutes.

"We were going to start at 5 a.m. yesterday and we have had no sleep since, but the wind was right across the aerodrome, and we had to postpone it.

"Later on it turned round, and it was possible to get off. It was a very strong wind, about 40 miles an hour. We had to fly up a valley, and we got some very bad bumps. That was the only time I ever had the engines full out.

"We climbed quickly to our height of 1,000 ft. At Signal Hill Lieut. Brown set out a course for the ocean on 124 degrees compass course. We kept that course until well on in the night. I had the engine throttled down nicely and I let her do her own climb. At dark we were about 4,000 ft. up. We found it very cloudy and misty. We were between two layers of cloud and could see neither sea nor sky. After the first hour we had got into these clouds, one lot 2,000 ft. up, and the other 6,000 ft.

"It was impossible to see the sea to get our drift. The clouds above obscured the sun, and when night came we could see neither stars nor moon, so we flew on our original course until we struck a patch about 3 a.m. We saw a few stars.

"'I got a cut on Polaris and Vega,' said Lieut. Brown, interrupting. "'I got my position then, and found I was about 2 degrees south.'"

Continuing, Capt. Alcock said: "Brown gave me the new course of 110 degrees compass points. We went on steadily until the weather started to get very thick again.

"That would be about 4 a.m. or 5 a.m. We could see nothing. The bank of fog was extremely thick, and we began to have a very rough time. The air speed indicator jammed. It stood at 90, and I did not know exactly what I was doing. It jammed through sleet freezing on it, and it smelt smoky. We did some comic 'stunts' then. I believe we looped the loop and by accident we did a steep spiral. It was very alarming. We had no sense of horizon. We came down quickly from 4,000 ft until we saw the water very near. That gave me my horizon again, and I was all right. That period only lasted a few seconds, but it seemed ages.

"It came to an end when we were within 50 ft. of the water with the machine practically on its back. The air speed indicator had again begun to work as the result of the swift dive. We climbed after that and got on fairly well until we got to 600 ft., and fog was there again. I climbed twice on top of it, only to find banks of clouds. We went higher and saw the moon and one or two stars. We carried on until dark. We never saw the sun rise. There was a bank of fog also on top of the lower one.

"We climbed up to 11,000 ft. It was hailing and snowing. The machine was covered with ice. That was about 6 o'clock in the morning, and it remained like that until an hour before we landed. My radiator shutter and the water temperature indicator were covered with ice for 4 or 5 hours.

"Brown had continually to climb up to chip off the ice with a knife. The air speed indicator was full of frozen particles and gave trouble again. They came out when we got lower, an hour before we landed.

"We came down and flew over the sea at 300 ft. It was still very cloudy, but we could see the sun as he tried to break through. It was a terrible trip. We never saw a boat and we got no wireless messages at all.

"We flew along the water and we had doubts as to our position, although we believed we were 'there or thereabouts.' We looked out for land, expecting to find it at any time.

"We saw land about 9.15 a.m., when we suddenly discovered the coast. It was great to do that. We congratulated each other. We were very pleased our job was over.

"We saw two little islands which must have been Eashal and Turbot Islands. We came along and got to Ardbear Bay (an inlet of Clifden Bay), and when we saw the wireless mast we knew where we were exactly. We flew along looking for a place to land.

"When still over Clifden village I saw, after a few minutes, what I took to be a nice field—a lovely meadow. We came down and made a perfect landing. But it was a bog. The wheels sank axle deep in the field, the Vimy toppled over on her nose. The lower plane is badly damaged and broken, and both propellers are deeply sunk in the bog, but, I think, not broken. The engines are all right.

"After breakfast I went back to the machine and rescued the mails and the instruments. Messrs. Vickers are sending two men to rescue the machine, but it will need several mechanics and they will have to lay out a track to get it out."

I asked the airmen how they had done it so quickly. Lieut. Brown answered :

"The winds all the way were favourable. I said before we started that if the wind held we should do the trip in 16 hours, but we never expected to." Captain Alcock continued :—

"We ate meat sandwiches. I ate three and Brown five. I drank four cups of coffee and so did Brown. We fed spasmodically—3 or 4 times—just when we felt we wanted to. We ate chocolates, too. I was not hungry, but frightfully thirsty. We shared the last cup of coffee. We did not suffer from cold. Our suits kept us warm.

"The cockpit was very cosy indeed, but when we peered over the side, sleet and ice chewed bits out of our faces.

"For a time we spoke to one another by means of communication telephones, but they broke down and we had to discard them after 4 hours. After that we had to shout."

On hearing of the successful conclusion of the flight, H.M. the King sent the following telegram to Major-General Sir F. H. Sykes, K.C.B. :—

"The King was delighted to receive your welcome announcement that Capt. Alcock and Lieut. Brown have safely landed in Ireland after their trans-Atlantic flight. His Majesty wishes you to communicate at once with these officers and to convey to them the King's warmest congratulations on the success of their splendid achievement."

Many other famous and notorious people also sent messages, none of which need reproduction as the English would appear to lack genius in the art of congratulation.

The necessary inspection of the seals on the Vickers biplane was made by Major Mayo, R.A.F., on June 15th, and the necessary certificate signed.

The average speed of the flight was about 118 miles an hour. The greatest credit is due to Lieut. Brown for his high skill in navigation under conditions of great difficulty.

The Vickers Vimy had been taken up for a trial flight on June 9th at 8.17 p.m. (G.M.T.). A forty minutes' flight was made. The wireless installation on this occasion worked satisfactorily.

Other Competitors.

The Handley Page biplane has made several trial flights during the past week. On June 13th a flight of eighty minutes was made with five passengers on board, and everything worked satisfactorily.

It was intended to make an attempt on the trans-Atlantic flight on Friday last, but the radiators were found to be defective and a further delay was necessary. The radiators have now been replaced by others sent from England and an early attempt at the flight may be expected.

Mr. Raynham has almost completed the repairs of the Martinside machine and his new navigator, Lieut. Biddlecombe, has arrived from England.

The R.34.

The British rigid airship, R.34, is now at East Fortune waiting an opportunity to cross the Atlantic. Preparations have been made near Atlantic City, U.S.A., for the reception of this ship, and a party of R.A.F. officers are in America in charge of all arrangements. The United States Government is giving every possible assistance in this matter.

On June 14th she was taken up on a trial flight, leaving East Fortune in company with R.29. They left ground shortly after 10 p.m. and flew over North Berwick, Edinburgh, Rosyth, Mary Island and back to East Fortune, landing at that place at 4 a.m. Wireless communication was made with the Azores, a distance of 1,200 miles.

THE FELIXSTOWE FURY.

By CAPTAIN P. A. BARRON (late R.A.F.)

In a recent issue of The Aeroplane there appeared a letter appropriately headed "Fury at Felixstowe." The writer of this letter appears to be suffering severe cerebral emotion over the abandonment of the projected attempt to fly the Felistowe "Fury" across the Atlantic.

A few lines from the letter may be repeated. The writer says :

"Since the last long trial a few weeks ago new engines (low compression) have been fitted, and now comes the first instance of red tape in which we are entangled. A new mid-ship propeller was necessary. This took five weeks to order, because the Treasury would not grant the expenditure involved. Even so, they are paying millions per week on tomfoolery in other ways, and I am sure the taxpayers would not begrudge £30 or £40 extra for the honour of making the country's attempt successful.

"At the same time, the Navy refused to carry the boat to Newfoundland as they had no 'finger in the pie,' notwithstanding the fact that all the officers and men were old R.N.A.S. people. So it was decided to fly from this side. Now for the crowning insult to all of us who stood by to see her finished. The Right Hon. Winston Churchill refuses to sanction the Atlantic flight and makes the miserable excuse that private firms should have the first chance, and this after all the time and money that have been spent in designing and building the most successful seaplane in existence."

On the day following the publication of this letter the "Daily Mail" stated that :—

"With a picked crew of five, it has been in readiness for the attempt since early in April, but the numerous postponements, and finally the abandonment of the venture on account of 'the great cost' were ascribed yesterday to Mr. Churchill's refusal to give his consent.

"The first estimate for shipping the 'Felixstowe Fury' to Newfoundland in a British battleship—no other shipping was available—and flying to Great Britain was £80,000; but as

pensive, even when one remembers that it is supposed to be an official estimate, and not one submitted by a private company of profiteering patriots who have unfortunately not been repatriated by the Zionists.

The Navy would not have to consider the pay of officers and men—on the new scale—in their estimate, for that is a constant whether the ships are accumulating barnacles in harbour or burning the product of over-paid coal-miners on the high seas. To the non-departmental mind it would appear that the cost of ocean transport would be confined to fuel and depreciation, as Service labour costs the same whether it is employed on useful work or is limited to holystoning and brass polishing. One repeats, therefore, that the figure of £80,000 does not appear to be a reasonable estimate and one is disinclined to believe that it is an official one.

The correspondent's suggestion that the Navy refused to carry the "Fury" to Newfoundland because they had "no finger in the pie" may, of course, be inspired by memories of the time when the R.N.A.S. loved the Navy as much as sparrows love hawks. However, one does not give undue importance to this view. The Archimandrites of the Silent Service probably did not make the decision.

One believes that the "Felixstowe Fury" was designed and built in answer to the demand of the Admiralty for an aircraft that could cruise to any part of the North Sea with the Fleet, and carry sufficient fuel to return to England. It is a R.A.F. product in name only, for those responsible for it are ex-R.N.A.S. officers, so it is hard to believe that the Admiralty could have taken up the attitude suggested.

One must admit, however, that those concerned have not shown the energy that might have been expected, and in this connection it is interesting to note a view expressed in an American journal.

This newspaper, which at the time the comment was made was

NAVAL & MILITARY AERONAUTICS

FROM THE "LONDON GAZETTE."

War Office, June 3rd

The following are mentioned for their services during the period from Sept. 19th, 1918, to Jan. 31st, 1919, in a dispatch which has been received by the Secretary of State for War from General Sir E. H. H. Allenby, G.C.B., G.C.M.G., Commander-in-Chief, Egyptian Expeditionary Force :—

Royal Air Force.—Capt. (actg. Maj.) A. J. G. Anderson, Maj. C. W. Anstey, Maj. J. O. Archer, Capt. and Hon. Maj. W. R. G. Atkins, Lt. J. E. Atkinson.

Lt. L. C. Bailey, Capt. A. H. S. Baker, Lt. (actg. Capt.) S. Baker, Lt. R. S. Barbour, Maj. V. A. Beaufort, M.C., Sec. Lt. and Hon. Lt. H. C. Blachford, Lt. C. F. Blunt, Lt.-Col. (actg. Brig.-Gen.) A. E. Borton, D.S.O., A.F.C., Capt. R. C. Boddie, Lt. S. L. Botham, Lt.-Col. C. Bovill, Lt. J. S. Bowker, Lt.-Col. H. Le M. Brock, D.S.O., Capt. J. Brown, M.C., Lt. W. C. Brown, Lt.-Col. H. Burchall, D.S.O., Lt.-Col. C. S. Burnett, D.S.O.

Capt. J. Chambre, M.D., Sec. Lt. G. S. Coggan, Capt. P. Colbeck, Capt. J. A. Cooper, Rev. G. V. Cotton, C. to F., 5th Cl. (R.A., Chap. Dept.), Lt. (actg. Capt.) D. F. Cox, Lt. (actg. Capt.) K. A. C. Creswell, M.B.E., Capt. W. G. M. Crothers.

Sec. Lt. C. F. Dakin, Sec. Lt. C. T. Davis, Lt. R. J. Divers, Capt. I. N. Dracopoli, Capt. (actg. Maj.) R. M. Drummond, D.S.O., M.C.

Sec. Lt. W. C. Egerton, Capt. J. Edwardes-Evans, Lt. (actg. Capt.) A. Eggar, Lt. G. M. Elloart, Lt. A. T. Essex.

Capt. T. Fawdry, Sec. Lt. G. Felstead, D.C.M., Sec. Lt. C. A. C. Fidler, D.C.M., C.M.G., Lt. D. J. Fleming, Lt. Col. C. Fraser, O.B.E., M.C.

Lt. (T./Capt.) P. J. Gething, M.C., Lt. (T /Capt.) H. J. Gibson, Lt.-Col. N. Goldsmith, O.B.E., Lt. W. E. Gower, M.C., Lt. and Hon. Capt. E. H. Grant.

Maj. (actg. Lt.-Col.) R. Hall, M.B.E., Lt. C. M. Hallett, Lt. B. Heath, Lt. L. A. C. Helbert, Col. (actg. Brig.-Gen.) P. L. W. Herbert, Sec. Lt. R. J. Hibberd.

Lt. (actg. Capt.) T. S. Ivens.

Capt. F. F. Jeoate, Lt. C. F. K. Johnston.

Maj. (actg. Lt.-Col.) A. H. C. Kearsley, D.S.O., Capt. (actg. Maj.) M. Keegan, M.M.

Lt. R. H. Ley, Hon. Lt. (actg. Capt.) P. L. Lindup, Lt. (actg. Capt.) C. E. W. Lockyer, Capt. (actg. Maj.) S. H. Long, D.S.O., M.C.

Lt. G. C. Macintosh, Sec. Lt. and Hon. Lt. L. G. Martin, Lt. P. D. S. Milnes, Lt. R. Morroch, Capt. B. Mott, Lt. L. A. Mudge.

Lt. A. G. Oliver, Capt. T. D. H. Osborn.

Lt. (actg. Capt.) J. Page, Lt. and Hon. Capt. S. J. Palmer, Capt. (actg. Maj.) A. H. Peck, D.S.O., M.C., Maj. (actg. Lt.-Col.) E. W. Powell, Lt.-Col. W. H. Primrose, D.F.C.

Lt. and Hon. Maj. C. W. Rowe, Lt.-Col. R. E. M. Russell, D.S.O.

Maj.-Gen. W. G. H. Salmond, C.B., D.S.O., Capt. A. G. Saxty, Capt. K. G. Sclanders, M.C., Lt. W. L. Shaw, Lt. (actg. Capt.) W. Sutherland.

Maj. (actg. Lt.-Col.) A. W. Tedder, Capt. F. Tedman, Lt. (actg. Capt.) D. N. Thomsen, M.C., and Capt. F. Tuttle, D.S.M. (K. Berks. R.).

Maj. H. G. Wakefield, Lt. and Hon. Capt. G. N. Wales, Sec. Lt. and Hon. Lt. N. W. Walmsley, M.C., Lt. R. Watson, Lt. A. H. Waugh, Lt. and Hon. Maj. W. A. Webb, Lt. P. G. Wells, Sec. Lt. F. Whilton, D.C.M., Capt. (actg. Maj.) F. R. Williams, Sec. Lt. K. D. Wills, Sec. Lt. (actg. Lt.) H. Wolfenden, Lt. J. Wood.

403415 Serjt. Clk. S. E. Ambrose, 68010 Cpl. Clk. (actg. S. /Serjt.) J. H. Austing.

27360 1st A.M. H. G. Banks, 107782 Ldg. Aircraftman A. Barber, 403800 Serjt. Mech. F. A. Bartlett, 25094 Chief Mech. P. Beaumont, 31097 1st A.M. T. Berry, 67355 1st A.M. A. F. Bicknell, 28796 1st A.M. F. C. Boxall, 128893 1st A.M. H. J. Brain, 4326 Cpl. Mech. F. Brookes, 33294 Serjt. Mech. L. Brown, 29089 Chief. Mech. W. A. Brown, 7735 Cpl. Mech. N. H. Brownstone, 9494 Serjt. Clk. C. W. Burrell.

404019 Cpl. Mech. J. Cairnes, 403224 Cpl. Mech. J. Candlish, 27418 Cpl. Mech. W. E. Clarke, 8986 1st A.M. C. H. Coleman, 310530 3rd A.M. A. Collins, 407186 Ldg. Aircraftman H. W. Couch, 12245 1st A.M. J. Crabtree.

78263 Cpl. Mech. F. W. Davies, 18034 Cpl. Clk. R. W. Dawson, 135715 1st Aircraftman J. A. De Garis.

1168 Chief Mech. H. Edwards, 130935 Cpl. Clk. C. Ellison, 130475 Ldg. Aircraftman W. J. Everest.

11258 1st A.M. H. S. Fernee, 5507 Chief Mech. W. A. Fernee, 78043 S.M. J. P. Flanagan, 39122 Serjt. Mech. R. W. Forder, 403599 Chief Mech. S. Fouracre.

403893 1st A.M. A. T. Gambrell, 5999 Chief Master Mech. G. R. Guinea.

26802 Serjt. Mech. J. Hack, 21024 Ldg. Aircraftman F. H. Hammond, 61623 Cpl. Mech. G. Hawkyard, 5724 Chief. Mech. H. A. Hemmings, 2931 Chief Mech. E. Hewitt, 28063 1st A.M. T. H. Hewlett, 19351 Serjt. Clk. W. E. Hicks, 31041 Cpl. Clk. S. C. Holbrook, 2371 Chief Mech. W. C. Holding, 28555 Cpl. J. F. Holliday, 403822 Serjt. Mech. L. Holt, 404084 Serjt. Clk. E. C. Howell, 11577 1st A.M. A. Hulett.

40258 Chief Mech. F. W. Jackson, 37413 1st A.M. W. E. Janes, 403605 Serjt. Clk. H. A. Jenkerson, 50463 1st A.M. E. C. H. Johnstone, 28131 Cpl. Mech. F. W. Judd.

40868 Cpl. Mech. (actg. Serjt. Mech.) A. Knight

403502 Chief Mech. B. Lamb, 12128 Chief Mech. J. W. Large, 403615 Serjt. F. Lee, 403884 Cpl. Mech. J. Lumsden, 301121 Serjt. J. Lyndon.

85474 Cpl. D. Macfarlane, 409128 Serjt. Mech. R. C. Maggetts, 403093 1st A.M. E. T. Matthews, 35702 Serjt. Mech. W. G. Mathis, 5648 Chief Mech. J. W. Maud, 23677 Cpl. Clk. T. Mayor, 403677 1st A.M. S. McBride, 29022 Cpl. Mech. W. E. Meavers, 33554 Flt. Clk. W. Mendoza, 2800 Chief Mech. J. G. Menneer, 16816 1st A.M. B. Milne, 33300 Serjt. Mech. W. C. Moorhouse, 10505 Chief Mech. A. Morgan, 2712 Serjt. Clk. A. R. Morris, 75816 Cpl. Clk. J. G. Moses.

18528 1st A.M. H. F. Nicholl, 109710 Cpl. Clk. J. A. Nicholls, 22607 1st A.M. J. R. Nield (died), 403594 Chief Master Mech F. Norton.

9004 1st A.M. A. Oliver, 6551 Chief Mech. J. Owen.

39655 Cpl. Mech. G. Papworth, 63358 1st A.M. H. L. Parkes, 23414 Serjt. Clk. H. Parsons, 33674 Chief Mech. D. Paton, 405632 Cpl. Clk. (actg. Serjt. Clk.) E. B. Payton, 19716 Cpl. Mech. T. L. Pearce, 8898 Serjt. Mech. E. Perryman, 127212 2nd A.M. F. W. Phares, 107974 2nd A.M. A. C. Prentice, 33667 Chief Mech. T. Prescott, 41384 Cpl. Mech. H. Prime, 403420 Cpl. P. Pritchard.

68688 Ldg. Aircraftman (actg. Cpl.) E. C. Rapkin, 37666 Cpl. Clk. W. H. Reed, 18539 Flt. Clk. J. Richard, 403808 S.M. F. Rowden, 133747 1st Aircraftman F. L. Russell

30802 Serjt. Mech. J. T. Sankey, 32237 Chief Mech. F. W. Sant, 143329 Serjt. Clk. R. Scott, 107124 Ldg. Aircraftman L. R. Selby, 108970 Serjt Clk. F. Shelley, 6054 Serjt. Mech. E. R. Shutter, 31593 Serjt. Mech. A. R. Simmons, 407454 Flt. Clk. K. E. Simpson, 08565 1st Aircraftman E. G. G. Sparkes, 32504 Cpl. G. Stanborough, 10100 Flt. Serjt. R. R. Standbridge, 3494 Serjt. Mech. R. E. Stickley, 31544 1st A.M. F. W. Swatton.

50879 Sert. Mech. A. V. Teitien, 27170 Pte. G. F. Thorp (Norf. Yeo., T.F.) (attd. R.A.F.), 5002 Serjt. Mech. A. Tyler.

19211 Ldg. Aircraftman J. M. Unwin.

14785 1st A.M. G. E. Varney.

404056 Cpl. Clk. (actg. Serjt. Clk.) C. G. White, 75282 Cpl. Clk. P. White, 103714 Cpl. Mech. E. W. E. Wicks, 7830 Serjt. Mech. (actg. Chief Mech.) T. P. Wilkins, 37177 Serjt. J. Wilson, 405325 Cpl. Mech. J. Wilson, 30283 Chief Mech. G. H. Womersley, 33780 Serjt. Mech. G. Wood, 32578 Serjt. Clk. T. Woodcock, 23382 Chief Mech. G. R. Woods

Air Ministry, June 3rd.

The King has been pleased, on the occasion of His Majesty's birthday to confer the following awards :—

OTHER REWARDS

The King has been pleased to approve of the following rewards to officers and other ranks of the Royal Air Force in recognition of distinguished services rendered during the war :—

Bar to the Distinguished Service Order.

Lt.-Col. F. W. Bowhill, D.S.O. (Mediterranean). (D.S.O. gazetted Feb. 22nd, 1918.)

Distinguished Service Order.

Capt. (actg. Maj.) W. L. Birch, M.B.E. (W. Yorks. R.) (Egypt).

Lt.-Col. E. L. Gossage, M.C. (R. Arty.) (France).

Capt. R. King, D.F.C. (Aus. F.C.) (France)

Lt.-Col C. T. Maclean, M.C. (R. Scots Fus.) (France),

Maj. (actg. Lt.-Col.) L. A. Pattinson, M.C., D.F.C. (R. Fus.) (I. Force) (France).

Lt.-Col. C. E. Risk (R.M.L.I.) (Mediterranean); Maj. J. C. Russell (R.E., T.F.) (France).

Second Bar to the Distinguished Flying Cross.

Lt. (actg. Capt.) W. H. Longton, D.F.C., A.F.C. (France). (First Bar gazetted Feb. 8th, 1919. D.F.C. gazetted Nov. 2nd, 1918. A.F.C. gazetted June 3rd, 1918.)

Bar to the Distinguished Flying Cross.

Lt. E. O. Amm, D.F.C. (France) (D.F.C. gazetted Dec 3rd, 1918); Capt. R. N. G. Atkinson, M.C., D.F.C. (France) (M.C. gazetted Oct. 18th, 1917; D.F.C. gazetted Nov. 2nd, 1918).

Sec. Lt. E. G. Davies, D.F.C. (France) (D.F.C. gazetted Feb. 8th, 1919).

Lt. (actg. Capt.) D. Grinnell-Milne, D.F.C. (R. Fus.) (France) (D.F.C. gazetted Feb. 8th, 1919).

Lt. (actg. Capt.) M. C. McGregor, D.F.C. (France) (D.F.C. gazetted Nov. 2nd, 1918).

Capt. J. W. Pinder, D.F.C. (France) (D.F.C. gazetted June 3rd, 1918).

Capt. W. D. Thom, D.F.C. (I. Force) (France) (D.F.C. gazetted Aug. 3rd, 1918).

Distinguished Flying Cross.

Lt. A. H. A. Alban (R.F.A.) (France).

Lt. (actg. Capt.) F. H. Baguley (France), Maj. C. Baker (Aus. F.C.) (France); Lt. (actg. Capt.) J. M. Batting (India); Lt. E. B. S. Beaton (Aus. F.C.) (Palestine); Lt. (actg. Capt.) V. Beecroft (France); Lt. A. L. B. Bennett (Hants R.) (Palestine); Capt. N. A. Bolton (R.F.A.) (Palestine); Sec. Lt. P. Boulton (France); Capt. (actg. Maj.) G. H. Bowman, D.S.O., M.C. (R. War. R.) (France); Lt. C. A. Bridgland (E. Surr. R.) (I. Force) (France); Sec. Lt. H. P. Burmell (Flanders).

Sec. Lt. D. S. Carrie (France) Sec. Lt. (Hon. Capt.) W. A. Carrothers (Can. Inf.) (France); Lt. (actg. Capt.) H. C. Chambers (I. Force) (France); Lt. A. E. Chittenden (France); Sec. Lt. (Hon. and actg. Lt.) W. Coker (E. Surr. R.) (France); Lt. H. N. Compton (France); Capt. (actg. Maj.) A. Coningham, D.S.O., M.C. (France); Sec. Lt. I. B. Corey (France); Sec. Lt. R. C. Creamer (France); Lt. (actg. Capt.) C. W. Cudemore, M.C. (France); Lt. D. B. Cumming (I.A.R.O.) (India); Lt. (actg. Capt.) J. Cunliffe (I. Force) (France).

Lt. (actg. Capt.) E. E. Davies (Aus. F.C.) (France); Lt. (actg. Capt.) W. H. Demel (Manc. R.) (France); Sec. Lt. J. C. Deremo (France); Lt. J. H. Dewhurst (France).

Sec. Lt. C. H. Dickins (Can. Inf.) (France), Capt. T. M. Dickinson (Mesopotamia); Lt. N. S. Dougall (Lincs. R.) (Flanders); Sec. Lt. G. E. Dowler (France); Lt. S. L. Dowsell (Can. Inf.) (I. Force) (France); Lt. (actg. Capt.) J. E. Doyle (France); Lt. (actg. Capt.) A. T. Drinkwater (France); Lt. (actg. Capt.) L. de S. Duke (Can. Inf.) (France); Lt. D. C. Dunlop (France); Sec. Lt. A. C. Dutton (R. W. Kent R.) (France).

Lt. (Hon. Capt.) C. S. Emden (R. W. Kent R.) (France); Lt. P. A. A Enright (Ægean).

Lt. (actg. Capt.) R. T. Fagan (France); Capt. C. Fawssett (R. Suss. R.) (France); Lt. (actg. Capt.) H. Ford (Norfld. Fus.) (France); Lt. S. G. Ford (France); Lt. (actg. Capt.) J. W. Foreman (France); Lt. W. T. Fraser (R.F.A.) (Palestine).

Capt. W. C. Gage (France); Capt. E. J. Garland (I. Force) (France); Maj. (actg. Lt.-Col.) A. G. R. Garrod, M.C. (Leics R.) (France); Sec. Lt. A. J. Garside (France); Lt. (actg. Capt.) F. G. Gibbons (France); Lt. (actg. Capt.) H. M. Golding (France); Sec. Lt. F. S. Gordon (France); Lt. R. J. P. Grebby (Palestine); Lt. (actg. Capt.) J. C. Green (France); Lt. (actg. Capt.) R. Grice (France).

Lt. F. A. D. Hamilton (Aus. F.C.) (France); Sec. Lt. F. C. Harris (K.R.R.C.) (France); Capt. G. J. Harter (Palestine); Lt. F. C. Hawley (Aus. F.C.) (Palestine); Lt. G. R. Hicks (France); Lt. J. C. Holmes (I. Force) (France); Lt. J. A. Hoogstero (France), Lt. (actg. Capt.) G. H. Hooper, M.C. (R.E., T.F.) (France); Lt (actg. Capt.) G. V. Howard (France); Capt. O. Hughes (India).

Lt. W. Jack (France); Lt. N. H. Jenkins, D.S.M. (Flanders); Lt. F. R. Johnson (France).

Sec. Lt. P. A. H. King (France).

Lt. O. Lamplough (Aus. F.C.) (France); Lt. J. H. Latchford (France); Capt. W. B. Lawson (I. Force) (France); Capt (actg. Maj.) C. M. Leman,

M.C. (France); Lt. (actg. Capt.) W. K. R. Liddell (H.L.I.) (France); Lt. W. S. Lighthall (Dorset R.) (Palestine); Lt. H. N. Loch (I.A.) (France).

Lt. (actg. Capt.) A. R. McAfee (France); Lt. (actg. Capt.) G. N. McBlain (France); Lt. (actg. Capt.) F. S. McClurg (France); Lt. (Hon. Capt.) A. D. MacDonald (42nd Sqdn.) (Can. Eng.) (France); Lt. E. N. MacDonald (I. Force) (France); Lt. N. S. MacGregor (France); Lt. (actg. Capt.) W. J. MacKenzie (Flanders); Capt. G. Mackrell (India); Sec. Lt. H. McLean (France); Lt. M. P. MacLeod (France); Lt. C. E. Maitland (R.G.A.) (France); Sec. Lt. (Hon. Lt.) C. M. Moore (France); Sec. Lt. J. R. Moorhouse (France); Lt. A. W. Murphy (Aus. F.C.) (Palestine); Sec. Lt. (Hon. Lt.) C. W. Murray (Glasgow Yeo.) (France)

Lt. F. Noble (France).

Lt. (actg. Capt.) H. A. Oaks (France); Lt. (actg. Capt.) G. C. O'Donnell (Palestine); Lt. (Hon. Capt.) J. E. A. O'Dwyer (Notts. and Derby. R.) (Salonika); Lt. K. J. Oldfield (Egypt).

Capt. (actg. Maj.) K. R. Park, M.C. (R.F.A.) (France); Lt. L. F. Pendred (Flanders); Sec. Lt. A. R. Pengilly (France); Lt. A. Pickin (France); Lt. G. A. Pitt (France); Sec. Lt. (Hon. Capt.) H. A Porter (R.G.A.) (France); Lt. (actg. Capt.) H. V. Puckridge (Shrops. L.I.) (France); Sec. Lt. H. R. A. V. Puncher (I. Force) (France).

Lt. T. G. Rae (France); Capt. (actg. Maj.) W. R. Read, M.C., A.F.C. (Dgn. Gds.) (I Force) (France); Lt. (actg. Capt.) T. Roberts (France); Lt. F. E. Robinson (France); Sec. Lt. A. Rogerson (France); Lt. H. Ross (Aus. F.C.) (France); Lt.-Col. F. M. Roxby, O.B.E. (N. Staffs. R.) (France); Lt. F. S. Russell, D.S.C. Flanders); Sec. Lt. (actg. Capt.) R. Russell (France).

Lt. H. P. Schoeman (France); Sec. Lt. F. W. Seed (France); Lt. R. A. Skelton (France); Lt. (Hon. Capt.) C. C. Snow (France); Sec. Lt. R. Stafford-Langan (Leinster R.) (France); Lt. (actg. Capt.) F. J. Stephens (France); Lt. F. J. Stevenson (France); Sec. Lt. (Hon. and actg. Capt.) H. W. Stockdale (France); Lt. J. A. Stronach (I. Force) (France); Lt. C. S. Style (Italy).

Sec. Lt. (actg. Capt.) J. F. D. Tanqueray (Can. Fces.) (France); Lt. R. A. Thomas (R. Welsh Fus.) (France); Sec. Lt. F. Thomasson (France); Lt. P. O. Thornton (France); Lt. U. G. A. Tonge (Flanders); Lt. (actg. Capt.) S. E. Toomer (R.G.A.) (France); Lt. (actg. Capt.) G. S. Travis (India); Lt. N. C. Trescowthick (Aus. F.C.) (France); Sec. Lt. (actg. Lt.) J. Turner (France).

Lt. E. W. Unmack (Ægean).

Lt. (actg. Capt.) C. L. Veitch (N. Lancs. R., T.F.) (France)

Lt. (actg. Capt.) H. Waddy, M.C. (France); Lt. J. F. Wallwood (Aus. F.C.) (France); Lt. (actg. Capt.) H. A. White (France); Capt. T. W. White (Aus. F.C.) (Mesopotamia); Lt. P. Wilkins, M.C. (R.E.) (France); Lt. B. C. W. Windle (102nd Sqdn.) (France); Lt. E. H. Williams (France); Sec. Lt. H. C. Wood (France); Lt. F. Woolley (France); Capt. J. W. Wright (Aus. F.C.) (France); Capt. H. N Wrigley (Aus. F.C.) (France).

Air Force Cross.

Lt. E. M. Ackery; Lt. C. L. Adamson; Capt G. Alchin (R.F.A., S.R.); Lt. (actg. Capt.) W. Algie, D.S.O. (Northd. Fus.); Lt.-Col. D. L. Allen (R. I. Fus.); Capt. (actg. Maj.) F. G. Andreae; Lt. H. W. Arnott (R.E.); Lt. L. B. Aylen.

Capt. L. M. Bailey (Egypt); Capt. G. Barrett (R.E.); Capt. T. A. Batchelor, D.F.C.; Capt. (actg. Maj.) F. A. Bates, M.C. (Denbigh. Yeo.) (Salonika); Col. (actg. Brig.-Gen.) J. H. W. Becke, C.M.G., D.S.O., (Notts. and Derby. R.); Lt. and Capt. R. J. B. Benson (Welch R.); Capt. (actg. Maj.) H. J. T. Berryman (Adriatic); Col. A. W Bigsworth, C.M.G., D.S.O.; Lt.-Col H. Blackburn, M.C. (France); Lt. C. W. Blain; Capt. (actg. Maj.) R. S. Booth; Lt. (actg. Capt.) W. T. Breach (A.S.C.); Lt. H. G. S. Broad; Capt. H. S. Broad; Lt. (actg. Capt.) D. C. M. Brooks, M.C.; Capt. L. L. Brown, D.S.C. (R. Fus.); Capt. R. S. Brown (Aus. F.C.); Lt. G. M. Bryer; Lt. (actg. Capt.) V. W. Burgess (Aus. Eng.); Maj. A. J. Butler, M.C. (R. I. Rif.)

Lt. (actg. Capt.) W. B. Callaway; Lt. (actg. Capt.) G. G. Callender (Aus. D.F.); Capt. C. W. Carleton (S.A.D.F.); Lt.-Col G. I. Carmichael, D.S.O. (R.F.A.); Lt. (actg. Capt.) E. T. Carpenter (Worc. Yeo.); Maj. R. S. (actg. Maj.) A. W. Cassy; Capt. T. C. Chamberlain (Middx. R.); Lt.-Col. E. T. R. Chambers; Lt. L. P. Chase (Aus. F.C.); Lt. (actg. Capt.) F. W. Clark (France); Maj. E. E. Clarke (Y. and Lan. R.); Capt. G. M. Clarke (Leins. R.); Lt. (actg. Capt.) L. Clarke (Manc. R.) (Egypt); Capt. G. E. Clinton (Loud. Scots); Capt. (actg. Maj.) W. Cloete, M.C.; Capt. R. B. Corfield; Maj. G. H. Cox (N. Staffs. R.); Lt. (actg. Capt.) W. R. Cox, M.C. (D.C.L.I.); Capt. (actg. Maj.) H. E. Craufurd; Capt. (actg. Maj.) G. M. Croil (Gord. Highrs., T.F.) (Egypt).

Lt. (actg. Capt.) H. Daniel, M.C.; Capt. R. Davies; Maj. H. G. Dean (Y. and Lan. R.); Capt. and Maj. M. Delchton; Capt. R. S. Devlin, D.S.C. (Canada); Maj. B. P. H. de Roeper (Egypt); Capt. N. H. Dimmock; Lt. (actg. Capt.) N. P. Dixon, Lt. R. M. Dixon (6th Berks.); Lt. H. H. Down (Artists Rif.); Lt. S. E. Dreschfeld; Lt. D. H. Drew; Lt. J. Drew; Capt. H. F. S. Drewitt, M.C. (N.Z.F.); Capt. (actg. Maj.) A. Duguid (R.F.A.); Capt. (actg. Maj.) A. Duston.

Maj. T. H. England, D.S.C.; Maj. (actg. Lt.-Col.) D. C. S. Evill, D.S.C.; Lt. R. T. Eyre.

Capt. A. B. Fanstone; Lt. (actg. Capt.) G. W. Ferguson, M.C. (R.A.S.C.); Maj. F. B. Fowler; Lt. G. J. Fowler, Sec. Lt. (Hon. Lt.) H. A. Francis; Capt. J. Freudelder; Capt. R. A. Fry, M.C. (H.L.I.); Capt. (actg. Maj.) P. F. Fullard, D.S.O., M.C. (R. I. Fus.).

Capt. A. N. Gallehawk; Lt. (actg. Maj.) F. C. Garratt (Canada); Capt. P. C. Garratt; Capt. C. L. E. Geach (Dgn. Gds.); Lt. T. Gilbert (I.A.R.O.) (India); Lt. (actg. Capt.) J. S. Gill (I. Force) (France); Lt.-Col. S. Grant-Dalton, D.S.O. (Yorks. R.) (Egypt).

Lt.-Col. (actg. Col.) J. C. Halahan, C.B.E. (R. Dub. Fus.); Sec. Lt. F. Hall (Y. and Lan. R.); Lt. H. Hamer; Capt. W. A. Hannay (L'pool R.) (Washington); Lt. D. A. Harding (Egypt); Maj. (actg. Lt.-Col.) S. H. B. Harris (K. E. Hse.); Capt. B. E. Harrison; Sec. Lt. (actg. Lt.) R. I. Hartley; Lt. Hon. Capt.) F. W. Hastridge; Lt. and Capt. G. Harwood (Essex R.); Lt. H. R. Hastings; Capt. W. L. Hay; Lt. (actg. Capt.) A. F. Hedges (Y. and Lan. R.); Maj. (actg. Lt.-Col.) G. L. P. Henderson, M.C. (R.E.); Lt. (actg. Capt.) J. B. Henry (R. Innis. Fus.); Capt. W. V. Herbert (Aus. F.C.); Lt.-Col W. C. Hicks; Maj.-Gen. J. F. A. Higgins, C.B., D.S.O. (France); Lt. (actg. Capt.) D'A. F. Hilton, M.C. (Canada); Lt. A. H. Hinton (C.F.A.); Lt. G. S. Hodson (Fliers); Capt. L. H. Holden, M.C. (Aus. F.C.); Capt. (actg. Maj.) F. P. Holliday, D.S.O., M.C. (Can. Eng.); Capt. H. T. Horsfield (Worcs. R.); Lt. (actg. Capt.) R. T. B. Houghton (Northants R.); Capt. G. F. Hughes, M.C. (Aus. Inf.); Capt. (actg. Maj.) R. E. A. W. Hughes-Chamberlain; Lt. C. A. Hyde (R. Fus.).

Capt. H. C. Irwin.

Lt. J. H. Jennings (R.A.S.C., M.T.); Capt. (actg. Maj.) M. R. N. Jennings, M.C.; Capt. C. N. Jones (Notts. and D. R.).

Capt. J. G. Kelly; Capt. N. Kemsley; Capt. J. Kerr (Gord. Highrs.); Lt. (actg. Capt.) S. G. Knock (Seaforth Highrs.).

Lt. (actg. Capt.) C. McM. Laing, M.C. (R. Scots Fus.) (Mediterranean); Capt. F. C. Lander; Maj. R. T. Leather (War. Yeo.); Lt.-Col. (actg. Brig.-Gen.) C. F. Lee, C.M.G. (K.R.R.C.) (Washington); Lt. (actg. Capt.) A. M. Lewis (R.G.A., S.R.); Capt. (actg. Maj.) G. L. Lloyd, M.C. (Staffs. Yeo.); Lt. N. B. Lovemore; Capt. (actg. Maj.) R. S. Lucy (Worc. R.); Lt. G. I. Lusted; Lt. (actg. Capt.) H. T. Lyllford.

Capt. (actg. Maj.) W. R. B. McBain, M.C. (R.F.A., T.F.) (Salonika); Capt. A. J. H. MacColl; Capt. (actg. Maj.) W. H. Mackenzie; Capt. N. MacMillan, M.C. (H.L.I.); Lt. K. I. Macpherson (Dorset R.); Lt. S. E. Mailer (Aus. Inf.); Capt. G. F. Mailey, M.C. (Aus. F.C.); Maj. (actg Lt.-Col.) P. C. Maltby, D.S.O. (R. Welsh Fus.); Capt. A. Mann, M.C. (R.A.S.C., T.F.); Lt. G. H. Martingell; Capt. G. C. Matthews (Aus. F.C.); Capt. (actg. Maj.) G. J. C. Maxwell, M.C., D.F.C. (Lovat's Scouts); Capt. (actg. Maj.) F. H. M. Maynard; Capt. H. Meintjes, M.C. (S.A. Forces); Capt. F. J. W. Mellersh; Lt. C. W. Meredith (S.A. Eng.); Capt. A. L. Messenger; Lt. (actg. Capt.) N. C. Millman, M.C. (Can. Eng.); Lt.-Col. R. P. Mills, M.C. (R. Fus.); Maj. G. A. N. Mitchell (R. Fus.); Lt.-Col. (actg. Col.) W. G. S. Mitchell, D.S.O., M.C. (H.L.I.); Lt. S. J. Moir (Aus. F.C.); Capt. H. H. de B. Monk, M.C. (R.F.C.); Maj. A. M. Morison (France), Capt. C. C. Morley; Lt. F. W. Morter (R. War. R.); Capt. (actg. Maj.) D. O. Mulholland (Conn. R.).

Capt. M. D. Nares; Lt. O. S. Neill; Capt. C. D. Nelson, D.S.C. (Vendome); Maj. C. H. Nicholas (S. Wales B.) (Egypt); Capt. J. Noakes, M.M.; Maj. M. W. Noel (L'pool R.).

Lt. G. S. O'Brian (Canada); Lt. H. D. O'Neill (R. Dub. Fus.); Capt. (actg. Maj.) J. O. C. Orton, M.C. (Norf. R.).

Lt. (actg. Capt.) G. S. D. M. Pape (France); Lt. R. S. Park; Lt. J. A. Paull (Can. Eng.); Capt. (actg. Maj.) L. G. S. Payne, M.C. (Suff. R.); Lt. (actg. Capt.) A. Peace (Can. Inf.); Lt. A. J. D. Peebles (Lond. R.); Lt. F. B. Pelly (Adriatic); Lt. M. W. Piercey (France); Lt. (actg. Capt.) C. Pilkington (Shrops. L.I.); Lt.-Col. C. F. Pollock, O.B.E.; Lt. S. H. Preston; Maj. E. R. Pretyman (Som. L.I.) (France); Lt. F. H. Prime (Can. Inf.).

Lt.-Col. C. E. C. Rabagliati, M.C. (Yorks. L.I.) (France); Sec. Lt. L. T. McK. L. Ray (Aus. F.C.); Lt. A. D. Reid (Vendome); Capt. C. E. Rich; Capt. A. I. Riley (Artists Rif.); Capt. H. J. Roach, Lt.-Col. R. M. Rodwell (W. Yorks); Lt. A. D. Rogers; Lt.-Col. R. P. Ross, D.S.O.; Lt. (Hon. Capt.) H. B. Russell (R.F.A.); Lt. W. L. Rutledge, M.M. (Can. Inf.).

Lt. (Hon. Capt.) D. C. W. Sanders (R.F.A.); Sec. Lt. B. Scovell; Lt. G. Sewell (Lincs. R.) (Egypt); Lt. (actg. Capt.) W. Sharpe (Gren. Gds.) (Egypt); Lt. F. H. G. Shepard. Capt. W. A. Shirlaw (H.L.I., T.F.); Capt. (actg. Maj.) A. M. Shook, D.S.O., D.C., Lt. F. D. J. Silwood; Capt. (actg. Maj.) L. H. T. Sloan (Cam. Highrs.); Lt.-Col. G. H. Smith; Capt. R. M. Smith, M.C., D.F.C. (Aus. F.C.) (Egypt); Lt. (actg. Capt.) R. N. Smith; Capt. (actg. Maj.) S. O. Smith; Capt. (actg. Maj.) D. Stewart (R. Scots); Lt. J. L. Stocks; Lt. E. A. Sullock (L'pool R.); Lt. J. H. R. Sutherland, M.B.E.; Capt. A. M. Swyny (R. I. Rif.).

Lt. R. M. Tailfourr (R. W. Kent R.); Capt. W. M. Tait (Dur. L.I.); Lt. L. Taylor; Capt. M. L. Taylor (R.E.) (France), Capt. G. Thom; Capt. M. Thomas (Welsh R.); Lt. J. A. Thompson; Maj. (actg. Lt.-Col.) A. A. B. Thomson, M.C. (R. War. R.); Capt. D. R. Thurstan; Capt. A. M. Tidey; Maj. B. Travers; Lt. C. T. Travers; Lt. C. C. T. Turner; Maj. (actg. Capt.) L. M. V. Tysscn.

Lt H. A. Vineberg.

Capt. (actg. Maj.) L. J. Wackett, D.F.C. (Aus. F.C.); Capt S. Walker (Aus. F.C.); Capt. W. H. de W. Waller; Maj. (actg. Lt.-Col.) R. B. Ward; Capt. W. K. F. G. Warneford; Maj. (Lt.-Col.) H. E. M. Watkins; Capt. Watson (E. Yorks.); Lt. W. Watt (R. Lan. R.); Lt. E. Lee Watts; Lt. S. Whitby; Lt. A. S. White; Lt. (actg. Capt.) C. A. B. B. Wilcock (R. W. Surr. R.); Lt. S. Wilkinson; Lt.-Col (actg. Col.) H. A. Williamson, C.M.G.; Lt. C. E. Wilmot; Lt. (Hon. and actg. Capt.) G. H. B. Wilson, M.C. (R.A.S.C.) (Egypt); Capt. G. C. Wilson, M.C., D.C.M. (Aus. F.C.); Capt. T. E. Withington (O. and B. L.I.); Lt. (actg. Capt.) F. T. Woods (Northants R.); Lt. (actg. Capt.) F. St. J. Woollard (E. Kent R.); Lt. (actg. Capt.) A. B. Wright (H.L.I.); Maj. A. C. Wright (Egypt).

Lt. F. Yorke-Smith.

NOTE.—Since the list of names appearing in this "Gazette" were placed in the hands of the printers the "Acting Ranks" indicated have been relinquished in the great majority of cases.

Royal Red Cross (1st Class).

Miss C. Cameron, Q.A.I.M.N., Service (Reserve), Matron, R.A.F. Nursing Service, Matlock.

Miss L. M. Holroyde, Matron, R.A.F. Aux. Hosp., Eaton Square, London.

Medal of British Empire Order.—Military Division.

No. 20024 Member (1) Mrs. M. B Brisley, Women's Royal Air Force, Upton, Chester. For gallant conduct and devotion to duty at Upton on Dec. 17th, 1918, in extricating one of the occupants from a crashed aeroplane, and assisting to remove the second man from the wreckage.

Honorary Rank.

Granted the Hon. Rank of Capt. on retirement in recognition of good service during the war:—Lt. M. C. Caley; Lt. A. D. MacDonald, D.F.C. (Can. Eng.).

Bar to Distinguished Flying Medal.

223740 Serjt. Mech. J. Chapman, D.F.M. (Newcastle-on-Tyne) (France).

Distinguished Flying Medal.

86267 Serjt. E. Antcliffe (83th Sqdn.) (France)

233777 Serjt. Mech. A. H. Banks (Rickling, Essex) (I. Force) (France); 214412 Serjt. Mech. G. Betteridge (Vauxhall, S.W.) (France); 223197 Serjt. Mech. W. S. Blyth (Stepney) (France); 23773 Serjt. W. Bonnor (Ilford) (France).

217755 Serjt. (Obs.) M. C. Day (Beckenham) (Flanders).

240137 Serjt. W. Greenwood (Haslington) (France); 402734 Serjt. Mech. J. Jones (Tenbury, Worcs.) (I. Force) (France); 222304 Serjt (Obs.) R. S. Joysey (Flanders).

109538 Serjt. P. A. McGuinness (Felling-on-Tyne) (No. 11 Sqdn.) (France).

93272 Serjt. Mech. G. Packman (Rochester) (France).

187480 Serjt. Mech. C. W Riseboro (S. Kensington) (Palestine); 402609 A.C.2 W. Roper (Leeds) (France); 91975 Serjt. Mech. I. H. Rowe (Newton Abbot) (France).

10559 Serjt. N Sandison (Grangemouth) (France); P/19765 Serjt. F. Sefton (98th Sqdn.) (France); 96939 Serjt. A Shepherd (Birmingham) (France); 7958 L.A.C. (actg Cpl.) C. R. C Shorland (Margate) (France).

10786 Serjt. A. H. Woolgar (Stratford) (France).

Air Force Medal.

201182 Ch. Mech. W. Angus (East Fortune)

205926 Cpl. Mech. W. J. Baker (Bristol); 232636 Serjt. (Obs.) H. A. M. Balls (Dunkirk); Aus./275 Serjt. J. M. Bennett (Windsor, Victoria, N.S.W.); 215839 A.M.1. (E) A. Berry (Calshot); 201271 Serjt Mech. J. Burrell (Lawthorne-Howden).

206005 Cpl. A. C. Chrisp (Calshot); 214875 Cpl. C. Davis (Longside).

316711 Flt. Serjt. H. S. Eltringham (Longside); 232633 A.M 2.S. J. A. Emery (Anglesey); 216320 Cpl. G. W. Evebank (East Fortune)

241541 A.M.1 J. N. Forteath (Farnham, Surrey); 222627 A.M.1 T. L. Griffiths (Anglesey); 201589 Cpl. Mech W. J. Greatholder (Killingholme).

R.N.201503 Serjt. Mech. S. J. Heach (Portsmouth); 167341 Serjt. A. C. Howarth (Seahouses).

205004 Cpl. C. F. Kidd (Longside); 213913 Flt Serjt. G. Kidd (Seaton Carew).

313806 Serjt. C. H. Lewry (Longside).

313043 Flt. Serjt. P. Norton (Longside)
313853 Ch. Mech. T. Parry (Peterhead).
230860 Ch. Mech. A. G. Poole (East Fortune).
208923 Col R. Reekie (East Fortune); 229864 Serjt. Mech. F. Reynolds (East Fortune).
Aus./8974 1st A./Mech. W. H. Shiers (Adelaide, South Australia).
95461 Serjt. Mech. C. N. Tabiner (Leeds) (I Force) (France)
260822 Serjt. J. R. Welsh (Hornsea); 218546 Ch. Mech. A. J. Woolhead (Killinghoime).

(To be continued.)

WAR OFFICE, June 5th.

The following are mentioned for distinguished and gallant services during the period Sept. 15th, 1916, to Dec. 31st, 1918, in a dispatch dated Jan. 18th, 1919, has been received by the Secretary of State for War from General F. R. Earl of Cavan, K.P., K.C.B., M.V.O., Commander-in-Chief of the British Forces in Italy :—

ROYAL AIR FORCE.—Sec. Lt. H. Baldwin, Sec. Lt. F. M. M. Ellis, Lt. A. J. Evans, Sec. Lt. J. L. Geddes, Sec. Lt. (actg. Capt.) H. K. Goode, D.S.O., D.F.C., Lt.-Col. (actg. Col.) P. B. Joubert de la Ferté, C.M.G., D.S.O. (Commdg. 14th Wing, R.A.F.) (Maj. and Bt. Lt.-Col., R.A.). Lt. A. L. McLaren, Sec. Lt. (actg. Lt.) S. E. Mills; Sec. Lt. and Hon. Lt. A. G. Mortlock, Sec. Lt. and Hon. Lt. F. C. Winby.
24961 Cpl. H. Atkinson, 30635 Serjt. J. Heslop, 4901 Cpl A. E. Hicks, 65830 S.M. A. McGarry, 24887 1st Aircraftman R. McLaren.

WAR OFFICE, June 6th.

REGULAR FORCES ESTABLISHMENTS.—Royal Flying Corps.—Military Wing.—Cdt. Wing Sqdn. Comdr.—Capt. W. J. May (Cambs. R., T.F.), from an Adjt., Cdt. Wing., Jan. 27th, 1918

AIR MINISTRY, June 6th.

R.A.F.—The following temp. appointments are made :—Group Commander (graded as Col., Staff).—Lt.-Col. P. B. Joubert de la Ferte, C.M.G., D.S.O., June 3rd, vice Lt.-Col. W. R. Freeman, D.S.O., M.C.

Col. (Staff).—Lt.-Col. C. H. Drew, C.M.G., C.B.E., June 3rd.

Staff Officers, 2nd Cl. (P.).—Maj. J. S. T. Bradley, from Staff Offr., 1st Cl., May 31st, vice Lt. H. J. G. Newman, M.B.E. (substituted for notification in "Gazette," May 27th).

Staff Officers, 2nd Cl. (graded for pay at Air Ministry rates).—Maj. G. R. Moser, 14th April to 4th; Capt. (actg. Maj.) W. J. C. Kendall, March 5th, and to retain actg. rank of Maj. till April 30th

Staff Officers, 3rd Cl. (graded for pay at Air Ministry rates) (P).—Capt. N. Robertson, Feb. 19th; Sec. Lt. (actg. Lt.) R. Wight Feb. 14th, and to be actg. Capt. till April 30th; Lt. J. A. W. Bourne, Feb. 18th and to be actg. Capt. until April 30th (substituted for notification concerning the above officers which appeared in "Gazette," April 8th); Lt. (actg. Capt.) H. E. Burrell, March 24th, and to retain actg. rank until April 30th.

FLYING BRANCH.—Capt. C. H. Darley, D.S.C., D.F.C., ceased to be graded for purposes of pay and allowances of Maj. (A.), May 10th.

Capt. C. W. C. Browne to be Capt. (A. and S.), from (S.O.), May 21st.

The following Lts. ceased to be graded for purposes of pay and allowances of Capts. (A.) :—H. M. Coombs, D.F.C., G. S. White, May 19th.

Lt. H. C. Beeston to be Lt. (A. and S.), from (O.), April 20th, 1018 (substituted for notification in "Gazette," May 24th, 1918).

Flt. Cdt. 91550 L. Bacon is granted a temp. commn. as Sec. Lt. (A.), Oct. 8th, 1918.

P.F.O. J. M. Gray (late R.N.A.S.) is granted a temp. commn. as Sec. Lt. (O.), Nov. 7th, 1918.

The following relinquish their commns. on ceasing to be empld. :—Lt. R. W. Jackson (Lt., Cent. Ont. R.), Jan. 2nd; Sec. Lt. (Hon. Lt.) T. J. L. Ryan (Lt., Cent. Ont. R.), March 10th; Sec. Lt. (Hon Lt.) J. R. B. Francis (Lt., Can. M.G.C.), Sec. Lt. (Hon Lt.) J. F. A. H. Lindsay, D.C.M., M.M. (Lt., Sask. R.), Sec. Lt. (Hon Capt.) A. C. Rees, March 28th (substituted for notification in "Gazette," March 4th); Sec. Lt. (Hon. Lt.) F. Fletcher (Lt., R.A.), March 29th; Sec. Lt. (Hon. Lt.) W. F. Halsall (Lt., E. Kent R.), April 10th; Lt. (actg. Capt.) H. C. Southeran (Westn. Ont. R.), April 13th, Capt. G. L. Lowis, A.F.C. (Lt., R.N.), April 21st; Lt. F. J. Simpson (Lt., Brit. Columbia R.), April 24th; Lt. C. D. Palmer (Lt., Argyll and Sutherd. Highrs.), April 10th; Lt. G. G. Bell (Capt., E. Ont. R.), May 6th; Sec. Lt. M. G. Penny (Lt., R.A.), May 20th; Capt. C. E. Barrington, M.C. (Lt., R.A.); Lt. A. G. Foster-Sutton (Lt., E. Kent R.), May 22nd; Sec. Lt. (Hon. Lt.) A. E. Haynes, M.C. (Lt., R.A.), May 23rd; Lt. T. J. Denton (Lt., Canterbury Mtd. Rif., N.Z.), May 27th; Sec. Lt. A. D. Macpherson, May 31st.

Transferred to unempld. list :—Lt. H. G. Wood, Feb. 2nd; Sec. Lt. E. C. Nickerson, Feb. 27th; Sec. Lt. H. Walmsley, March 4th; Sec. Lt. F. Cornwall, March 8th; Sec. Lt. (Hon Lt.) T. W. Watts, March 13th; Sec. Lt. C. Dixon, March 14th, Lt. E. C. Bridgman, March 15th; Capt. F. J. Gibbs, M.C. (S. Staffs. R.), March 28th; Lt. C. H. Andrews, Sec. Lt. J. R. Watkins, Lt. H. Wilson, April 1st; Lt. D. P. Watt, Sec. Lt. D. P. Smith, April 4th; Sec. Lt. C. H. Wilson, April 5th; Lt. C. E. Weston, Sec. Lt. W. A. Westwood, Capt. J. S. Wright, April 9th; Sec. Lt. J. M. Welshman, April 10th; Sec. Lt. C. G. Gass, M.C. (Lond. R., T.F.), Sec. Lt. J. Hamilton, Sec. Lt. E. W. A. Smith, Lt. E. R. Watts, Sec. Lt. N. H. Waide, April 11th; Sec. Lt. W. Usher, April J. Hinde, April 12th; Sec. Lt. K. W. Dunmore, Lt. V. H. G. Parker, April 13th; Lt. A. Williamson, April 14th; Lt. W. L. S. Keith-Jopp, Sec. Lt. H. C. Webb, April 12th; Sec. Lt. (Hon. Lt.) H. O. Edmonds, Sec. Lt. H. F. Griffith, Sec. Lt. F. A. D. Vaughan, April 16th; Lt. B. M. Wainwright, Sec. Lt. N. H. Waide, April 17th; Lt. C. W. Usher, April 18th; Sec. Lt. B. A. Shields, Sec. Lt. P. H. Wade, Sec. Lt. G. E. Vickers, Sec. Lt. A. V. Whiteley, April 19th; Lt. V. R. Blow, Lt. R. H. Horwood, April 20th; Sec. Lt. K. L. Vernon, Sec. Lt. (Hon. Lt.) H. S. Winkworth, April 21st; Lt. E. H. Snell, April 22nd; Sec. Lt. W. H. Bennett, Sec. Lt. W. J. Haddick, Lt. C. F. A. Waerstaff, April 24th; Lt. D. A. Dircks, Lt. (actg. Capt.) H. Sanders, April 25th; Sec. Lt. R. A. Jacquot, April 26th; Capt. W. H. Chisham, April 27th; Lt. W. B. B. Freer, April 28th; Lt. H. J. Gearing (High. L.I.), Sec. Lt. A. J. Gwynn, M.C. (W. Yorks. R.), Lt. G. N. Hardwick, April 29th; Sec. Lt. W. G. Gadd, May 1st; Capt. T. C. Lloyd, May 3rd; Capt. N. Deakin (R.N. Devon Yeo., T.F.), May 5th; Lt. G. Cameron, May 6th; Sec. Lt. H. J. Heaton, Sec. Lt. A. J. Sanford, Sec. Lt. J. L. Sherwin, May 8th; Lt. J. M. Brisbane, M.C. (R. Scots), Sec. Lt. J. M. Heathcote, Sec. Lt. P. J. Shaw, May 9th; Capt. K. G. Saunders, M.C., May 10th; Lt. C. Byron, May 11th; Sec. Lt. F. J. Lidyer, Lt. E. H. Richards, May 12th; Sec. Lt. H. Shadelock, Lt. H. H. Thomnson, May 13th; Sec. Lt. S. J. Brain, Sec. Lt. T. H. Buxton, Sec. Lt. S. G. French, May 4th; Sec. Lt. S. G. Bates, Sec. Lt. A. R. Bell, Lt. C. L. Blake, Sec. Lt. A. J. Bonar, Sec. Lt. C. A. Bonar, Lt. W. D. Peock, May 15th; Lt. D. B. Barbour, Capt. H. D. Davis, A.F.C., Lt. W. F. Williams, May 17th; Lt. A. T. Baker, Lt. M. Taylor, Sec. Lt. A. Thom, May 17th; Sec. Lt. J. R. A. Barnes, Sec. Lt. A. H. Fuller, Lt. F. W. Palmer, V.C., M.M., Sec. Lt. W. J. Tucker, Sec. Lt. H. R. Smith, May 18th; Sec. Lt. P. R. Clare, Sec. Lt. M. J. Swanston, May 19th; Sec. Lt. J. Cries, Lt. C. V. H. Harrison, Lt. E. J. Jacques, Sec. Lt. J. J. Snow, Sec. Lt. F. W. Riley, Lt. J. Russell, Sec. Lt. G. M. Sampson, Sec. Lt. W. D. Saunders, Sec. Lt. C. A. Smith, Lt. G. F. Townsend, Sec. Lt. W. H. Settle, May 20th; Sec. Lt. S. E. Calvert, Sec. Lt. L. E. F. Dale, Sec. Lt. C. G. G. Fortune, Lt. G. D. Marks, Sec. Lt. J. Scholes, May 21st; Lt. C. H. Cooper, Capt. J. H. Storey, D.F.C., May 22nd; Sec. Lt. R. S. Carey, Sec. Lt. W. H. Corsan, Sec. Lt. S. W. Margetts, Sec. Lt. G. W. Perks, Lt. E. L. Roberts, May 23rd; Lt. C. B. Collins, Sec. Lt. R. J. Lewins, Capt. C. S. O'Grady, Lt. W. N. Porritt, May 24th; Sec. Lt. T. J. Mann, Sec. Lt. J. D. S. MacCullum, Sec.-Lt. (Hon. Lt.) A. H. Malan, Sec. Lt. C. F. Melville, Sec. Lt. A. A. Moir, Sec. Lt. J. W. Newdigate, May 25th; Sec. Lt. T. G. Evans, May 26th; Lt. C. K. McMullin, Lt. G. M. Metcalfe, Sec. Lt. K. W. J. Oldridge, Sec. Lt. N. S. Smith, May 27th; Sec. Lt. J. C. Baxter, Sec. Lt. R. Evans, Lt. J. F. N. Macrae, Lt. R. Musgrave, Sec. Lt. A. C. Porter, May 28th; Lt. H. D. Barton, D.F.C., Lt. F. P. Bellingham, Sec. Lt. E. Bernstein, Capt. F. W. Merriam, Lt. F. G. Newell, Sec. Lt. A. C. Porter, May 29th; Sec. Lt. R. J. Palmer, June 2nd; Lt. L. E. Birbeck, M.C., Lt. S. A. Gibbons, Lt. C. J. McCrane, June 3rd; Capt. R. O. Abercromby (Gord. Highrs.), June 5th.

The following relinquish their commns. on account of ill-health, and are permitted to retain their rank :—Maj. E. Dalziel, May 24th; Capt. J. R. S. Delvin, D.S.C. (contracted on active service), May 16th; Capt A. T. Hope, May 22nd; Lt. J. A. Baker (contracted on active service), May 17th; Lt. C. H. P. Hughes, Lt. C. G. Tysoe (contracted on active service), May 20th; Lt. W. J. T. Oliver, June 7th; Sec. Lt. A. H. Butler (caused by wounds), April 14th; Sec. Lt. G. V. Straker, May 8th; Sec. Lt. S. H. Whipple (contracted on active service), May 22nd; Sec. Lt. H. C. Allen (contracted on active service), Sec. Lt. J. Cornyn (contracted on active service), May 27th.

The following relinquish their commns. on account of ill-health :—Lt. F. C. J. Whigham (Can. Local Forces), May 24th; Sec. Lt. M. C. Burt, May 26th.

Maj. J. D. Maude is removed the services, the King having no further occasion for his services as an officer, March 8th.

The notification in "Gazette," April 1st, concerning Sec. Lt. G. F. Holford is cancelled.

The notification in "Gazette," Feb. 14th, concerning Lt. C. H. Dunster is cancelled.

The notification in "Gazette," Feb. 28th, concerning Lt. R. Main is cancelled.

The notification in "Gazette," April 29th, concerning Lt (actg. Capt.) O. C. Bridgeman, M.C., is cancelled (notification in "Gazette," April 18th, to stand).

The notification in "Gazette," May 23rd, concerning Lt. K. H. Johnson is cancelled.

The notifications in "Gazette," May 27th, concerning the undermentioned officers are cancelled :—Capt. (Hon Maj.) F. B. Binney, Lt. T. A. Byers.

ADMINISTRATIVE BRANCH.—Lt. (Hon. Capt.) (actg Capt.) A. M. Watson is graded for purposes of pay and allowances as Staff Officer, 3rd Class (P.), whilst empld. as Camp. Commandant for the period April 1st to April 30th.

Lt. (Hon. Capt.) A. M. Watson is graded for purposes of pay and allowances as Staff Officer, 3rd Class (P.), whilst empld. as Camp. Commdt., May 1st.

Majs. to be graded for purposes of pay and allowances as Lt.-Cols., from May 1st to May 7th :—J. B. Batten, D.S.O., R. M. R. Lamb, D.S.O., S. Snow, M.C. (temp. Capt. and Qmr., G.n. List), is granted temp. commn. as Capt., July 5th, 1918, seny. April 1st, 1918.

Lt. J. B. Pirie to be actg. Capt. whilst empld. as Capt from Dec. 24th, 1918, to April 30th (substituted for notification in "Gazette," Feb. 21st).

Lts. (A.) to be Lts. :—G. M. Metcalfe, May 21st; B. S. Johnston, May 22nd.

Lt. E. C. Richards to be Lt., from (O.), April 17th (substituted for notification in "Gazette," May 13th).

Sec. Lt. G. Thomson to be Lt., Dec. 25th, 1918.

G. N. Clift (Lt., R.E.) is granted a temp. commn. as Lt., April 1st (substituted for notification in "Gazette," May 23rd).

Sec. Lts. to be Lts. :—W. E. Tunks, from (A. and S.), May 24th.

Sec. Lt. C. R. French to be Sec. Lt., from (O.), May 21st

The following are granted temp. commns. as Sec. Lts. :—W. J. Begley, H. Cartwright, V. B. Randford, H. A. Williams, May 30th.

The following relinquish their commns. on ceasing to be empld. :—Lt. (actg. Capt.) W. Richardson (Lt., Norf. R.), April 9th; Lt. D. N. Stewart-Savile, M.C. (Lt., 12th Prince of Wales K. Lrs.), May 3rd; Lt. V. C. Roberts (Lt., E. Yorks. R.), May 6th.

Transferred to unempld. list :—Lt. W. D. Baird, Feb. 27th; Lt. J. E. Histed, March 21st; Sec. Lt. H. S. Peacop, April 3rd; Lt. O. D. Hay, Sec. Lt. T. Smith, April 9th; Sec. Lt. A. Longson, Sec. Lt. (Hon. Lt.) T. W. Walker, April 17th; Lt. C. H. Hartley, April 20th. Capt. (actg. Maj.) W. V. Sherwell, April 30th; Capt. H. Parker-Jervis, May 3rd; Capt. O. S. Shirriff, May 10th; Capt. H. M. Tysoe, May 15th; Sec. Lt. W. J. Scarff, May 16th; Sec. Lt. W. J. Baldwin, Sec. Lt. N. Cummings, Lt. A. H. Tarpey, May 17th; Lt. A. P. Chester, May 22nd; Sec. Lt. F. B. Morris, May 25th; Capt. H. A. Dawson, May 28th; Capt. W. T. Morris, May 29th.

Lt. J. W. Holdsworth is granted the hon. rank of Capt., May 9th.

Lt. J. W. Holdsworth relinquishes his comm. on account of ill-health, and is permitted to retain the rank of Capt., May 14th (substituted for notification in "Gazette," May 23rd).

Lt. (actg. Capt.) E. Gibbons relinquishes his comm. on account of ill-health, and is permitted to retain the rank of Capt., May 27th.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—K. A. Creery (contracted on active service), May 9th; L. H. Wrightmeyer, May 22nd; A. L. Freeman, May 27th.

Lt. (Hon. Capt.) A. P. Lunam, M.C., relinquishes his comm. on account of ill-health, May 23rd.

Sec. Lt. F. Neary relinquishes his comm. on account of ill-health, and is permitted to retain his rank, May 24th.

Sec. Lt. (Hon Lt.) A. H. Searle resigns his commn., May 28th (substituted for notification in "Gazette," Dec. 13th, 1918).

The rank of Lt. E. C. Chapman is as now described, and not as stated in "Gazette," Feb. 25th.

Notification in "Gazette," Dec. 20th, 1918, concerning F. W. Crawford, is cancelled (notification in "Gazette," Nov. 12th, 1918, to stand).

TECHNICAL BRANCH.—Lt.-Col. T. E. St. C. Daunell to be Col.-Col. from Depy. Dir., April 1st, and to relinquish the actg. rank of Col.

Capt. H. K. Kennedy-Skipton to be Capt., Grade (A.), from Grade (B), April 7th.

Lt. N. Penty to be actg. Capt. whilst empld. as Capt., Grade (B), from Oct. 15th, 1918, to April 30th.

Lt. G. F. Drudge ceased to be graded for purposes of pay and allowances as Capt., Grade (A.), May 19th.

Lt. W. V. Hunt to be Lt., Grade (B), from (Ad.), Oct. 1st, 1918.

Sec. Lt. H. C. Hull to be Lt., without pay and allowances of that rank, Nov. 11th, 1918.

Sec. Lt. R. J. Costigan (late Gen. List, R.F.C., on prob.) is confirmed as Sec. Lt., Grade (A.), May 6th, 1918.

The following relinquish their commns. on ceasing to be empld. :—Capt. D. H. Saunders-Davies (Lt., War. R.), May 7th; Lt. J. H. Turner (Capt., 2nd Dgn. Gds.), June 7th; Temp. Hon. Capt. F. J. Toulmin, June 7th.

Transferred to unempld. list :—Lt. (actg. Capt.) R. Scott, April 3rd; Lt. V. P. Spurway, April 14th; Lt. C. S. Kent, April 15th; Sec. Lt. A. West, April 10th; Sec. Lt. (actg. Lt.) A. Spring, April 25th; Sec. Lt. P. W. Bowman, May 6th; Capt. A. B. Davies, Sec. Lt. G. C. Harrison, May 8th; Sec. Lt. C. B. Southey, May 10th; Capt. (Hon. Maj.) J. Goodman, May 11th; Lt. H. R. Gregg, Lt. L. J. Pearce, May 14th; Capt. E. G.

Latt, Sec. Lt. S. F. Bianck, May 10th; Lt. (Hon. Capt.) A. H. Guerrier, Capt. A. V. Taylor, Capt. W. J. Walker, May 17th; Sec. Lt. R. H. Clarke, May 18th; Sec. Lt. G. W. Cox, M.C., May 20th; Sec. Lt. F. J. Harrington, May 22nd; Maj. C. W. De Koemer, R.F.A., May 23rd; Lt.-Col. A. B. Dayson (City of Lond. Yeo., T.F.), May 24th, Sec. Lt. F. Garrett, May 25th; Capt. W. H. J. Eldridge, Capt. H. F. Melville, May 26th; Sec. Lt. G. Epcole, Capt. J. H. Ward, May 27th; Capt. E. A. Gorton, June 6th.

Lt.-Col. A. E. G. MacCallum relinquishes his comm. on account of ill-health contracted on active service, and is permitted to retain his rank, May 24th.

Capt. H. Riddell relinquishes his comm. on account of ill-health contracted on active service, and is permitted to retain his rank, May 27th.

Sec. Lt. (actg. Lt.) J. A. McMullan, M.B.E., relinquishes his comm. on account of ill-health, and is permitted to retain rank of Lt., May 23rd.

Lt. (Hon. Capt.) F. Campbell (L'pool R., T.F.), relinquishes his comm. on account of ill-health contracted on active service, May 27th.

The following Sec. Lts. relinquish their comms. on account of ill-health and are permitted to retain their rank:—A. D. Birkhead, May 8th; J. H. Lester (contracted on active service), May 26th.

The notification in "Gazette," May 23rd, concerning Capt. S. E. Neal is cancelled.

MEDICAL BRANCH.—Maj. A. W. Iredell to be Lt.-Col., May 16th.

G. F. Marshall is granted a temp. comm. as Capt., April 17th.

E. A. Lumley is granted a temp. comm. as Capt., May 19th.

J. Fanning is granted a temp. comm. as Lt., May 19th.

Transferred to unempld. list:—Capt. C. Webb, April 1st; Capt. J. D. Bridger, Maj. R. R. Fasson, K.N., May 11th.

DENTAL BRANCH.—M. Thomson is granted a temp. comm. as Capt., July 15th, 1918 (substituted for notification in "Gazette," July 19th, 1918).

CHAPLAINS BRANCH.—The Rev. A. S. Bishop, temp. Chaplain to the Forces, 4th Cl., R.A.C.D. (Wesleyan), is granted a temp. comm as Chaplain with the relative rank of Capt., and is granted the relative rank of Maj. while empld. as Asst Principal Chaplain (Wesleyan), Jan. 1st.

MEMORANDA.—The following are granted the actg. ranks stated against their names, with effect from May 1st:—

To be actg. Lt.-Cols.:—Maj. P. F. Minchin, D.S.O., M.C., while specially empld.; Maj. C. E. Maude, while specially empld.

To be actg. Majs.:—Capt. H. A. Tweedie, A.F.C., while specially empld.; Capt. D. Cloke, while specially empld.; Capt. W. H. Dolphin, while specially empld.; Capt. W. F. Groves, while specially empld.; Capt. E. A. de L. DeVille, while specially empld.; Capt. L. P. Ferris-Scott, while specially empld.

To be actg. Capts.:—Lt. L. J. Stuart, while specially empld.; Lt. H. Tilley, while specially empld.; Lt. R. Hulley, A.F.C., while specially empld.; Lt. G. R. Travis, while specially empld.; Lt. A. Warburton, while specially empld.; Lt. W. J. Butler, A.F.C., while specially empld.; Lt. B. G. H. Keymer, D.F.C., while specially empld.; Lt. J. H. Robertson, while specially empld.; Lt. O. R. Gayford, D.F.C., while specially empld.; Lt. F. B. Wilson, while specially empld.; Sec. Lt. R. J. Bright, while specially empld.; Sec. Lt. A. W. Braun, while specially empld.; Sec. Lt. J. H. Boyd, while specially empld.; Sec. Lt. R. R. Trout, while specially empld.

The following to be granted the actg. rank stated against his name, with effect from May 26th:—To be Lt.-Col.—Maj. F. W. Lucas, O.B.E., while specially empld.

To be Lt.-Col.:—Maj. F. W. Lucas, O.B.E., while specially empld.

The following Overseas Cdts. are granted temp. comms. as Sec. Lts.: —316053 F. W. Anley, 1260663 H. R. Allan, 153469 S. A. Anfield, 72217 P. H. Applebee, 1262388 M. L. Applegate, 154678 G. E. Archibald, P.F.O. J. W. D. Archibald, 172594 J. E. Asselin, 72218 A. Aspell, 102854 T. A. Bayly, 137667 A. C. Benedict, 172456 M. I. Bisson, 153460, W. R. Blight, 316215 M. C. Blunt, 304488 A. F. Boddy, 316200 H. D. Bolton, 171850 L. R. Booth, 312889 E. A. Boyle, M/1286602 U. E. Boulanger, 9270 A. O. Bower, 80287 M. T. Bradley, 76120 W. T. Broome, 1774211 D. W. Bryant, 171432 M. C. Bundy, 180186 E. P. Burchfield, 1262388 M. 301574 H. G. Burley, 461118 G. N. Burwash, M/1152954 W. R. Busby, 172431 E. E. Cannon, 166370 D. G. S. Cameron, 1731444 J. H. Cameron, 778495 L. De V. Campbell, 171155 F. W. Carter, 12074 W. E. Chambers, 1006183 R. F. H. Charlick, 153502 L. G. Chavicnaud, 5049011 W. F. Cherry, 11227 C. F. Clarke, M2/153302 E. W. Clarke, 171744 R. C. Charles, M2/167190 A. E. Coates, 211275 J. MacP. Cowan, 153281 J. A. S. Cooke, 30546 J. Colling, 430668 J. B. Cooper, 316339 A. Cordell, 110104 F. M. Cornell, 172078 L. J. Cousineau, 28265 E. P. Croll, 313370 G. M. Crooks, 154054 A. M. Cumpsty, 1261441 W. E. Daley, 316031 F. R. Darrow, 24785 H. M. Davidson, 171753 R. Davis, 316317 R. W. Davis, 171417 F. De Bert, De Hart, 154688 D. E. De St. Dalmas, 171412 K. D. Dewar, 154781 G. M. Dickie, 154895 R. M. Dickinson, 329550 J. J. Douglas, 171702 R. J. Downey, 69732 A. A. Durbrow, 660921 L. P. Dussault, 175984 C. H. A. Duk 316138 A. P. Eaton, 52720 E. Eddington, 137690 R. I. Evans, 175096 E. T. Everett, 1269 E. Farr, 316015 E. E. Fisher, 2 G. St. B. Fleet, 347488 F. R. Flook, 65749 T. E. Fogarty, 300649 A. V. Forster, 64814 E. Fortin, 129287 F. Fraser, 124841 E. G. Fuller, 342840 W. S. Fuller, 108762 S. J. Fullerton, 172479 J. F. Galbraith, 171325 C. Gamsby, 154543 R. Genaron, 155078 A. C. Gibb, 235649 W. J. Gilson, 170147 D. G. Gregoric, 568707 J. I. Greig, 307455 J. W. Haddock, 154555 E. Job, 154908 S. R. E. M. Hankin, 154067 E. Hanley, 211850 G. R. Harland, 171915 N. F. Harston, 510556 R. O. Harris, 172457 R. L. Harvey, 42724 S. W. Hayward, 12977 A. Hendrie, 154316 F. S. Hewson, 114266 J. H. F. Hock, 154716 G. T. Horne, 769018 S. Howard, 1261669 N. A. Hunting, 5190 T. C. Ingram, 564717 T. R. Iredale, 873299 G. Jerome, 150836 E. Job, 154908 S. R. Kerr, 171449 G. W. C. Kinney, 137649 S. H. Kirtikar, 172390 R. I. Klean, 171171 T. S. Laird, 316145 L. De C. Laime, 154678 L. A. Lalonde, 264178 D. L. Lamson, 316600 R. D. Lawrence, 154164 J. G. Leask, 505404 C. Le Beau, 171619 W. R. Lethbridge, 244440 W. E. Lissaman, 97804 S. J. Livingstone, 40382 H. Lowndes, 100391 H. C. Lyon, 316012 R. J. Macdonald, 164038 S. M. MacDonald, 541225 H. F. MacKay, 179523 J. E. MacLaren, 211401 J. W. MasLeod, 2043531 C. R. McCulag, 154388 R. L. McFadden, 154139 E. A. McKay, 911357 F. L. McLeod, 183187 H. L. McNeill, 42077 S. McNeill, 316063 J. McNay, 1553 A. A. McQuiston, 811331 G. L. Maddrell, 50406 E. E. Marsh, 1174805 M. A. Mathieson, 56631 W. L. Maude, 304303 G. H. Mayor, 127021 R. L. Maquard, 61758 G. O. Merrill, 179454 H. M. Michael, 154701 A. H. Miller, 22118 J. S. Miller, 500797 T. Miller, 171814 I. M. Montgomery, 80211 A. L. Morfee, 171266 E. Morriand, — H. Mortimer, 2812010 E. G. Murphy, 72188 K. C. Murray, 316403 G. A. Nagle, 154738 V. Neil, 172364 L. A. Nettleton, 316075 A. R. Nichols, 218042 E. N. Nicol, 541286 W. H. Nixon, 158750 F. G. Orr, 348833 W. S. Page, 407031 A. D. Palmello, 364500 W. C. Parker, 154930 A. Paterson, 778203 G. R. Paterson, 171744 W. A. Paterson, 620019 L. R. Paton, 171064 A. J. Pauley, 512863 J. W. Pearson, 330636 L. D. Piket, 171491 J. G. Porter, 156900 R. N. Potter, 154679 G. H. Pound 150876 W. I. Riddell, 338864 C. V. Raine, 680 L. W. Raines, 8548/2 A. S. Read, 154000 W. Reddy, 316123 H. J. Reilly, 316200 R. D. Richardson, 475305 C. D. Roberts, 154005 L. Roberts, 316308 A. B. Robertson, 171226 J. Robertson, 12860 H. P. Robinson, 171437 N. W. Rogers, 171174 A. E. Rowley, 704060 C. A. Russell, 171147 H. V. D. Russell, 227726 H. J. Rush, 316014 W. T. Sanderson, 46078 W. B. Saunders, 154842 R. K. Sewell, 487353 F. C. Smith, 316110 H. S. Smith, 316035 H. W. Smith, 2730 C. F. Snook, 466081 R. M. Stevens, 101432 J. Stewart, 406405 L. V. Stewart, 02660 B. V. St. George, 154390 C. M. Stovell, 1428 H. Sykes, 421051 A. G. Taylor, 58052 E. J. Taylor, 925073 P. Taylor, 135 N. C. Taylor, 137471 W. C. Tennant, 171440 E. Thomson, 433200 J. C. Thompson, 453229 K. H. Thorne, 37232 C. W. Travers, 85537 T. Turner, 1200418 S. A. Vesy, 1350 R. A. W. Vickers, 171170 T. Walker, 174291 K. R. Walsh, 171566 W. B. Watt, 171814 E. M. Way, 316060 G. Webb, 319369 D. A. Wentzell, 17185, L. A. Werner, 614413 N. A. West, 316086 R. R. West, 14537 J. T. White, 1551445 H. B. Whitehouse, 3819 E. Williamson, 923055 E. R. Wilson, 171558 H. C. Wilson, 401098 P. Wyld, 171691 J. Young, Feb 15th.

Flt. Cadet 176660 M. J. O'C. Heffernan (since killed) is granted an hon. comm. as Sec. Lt., Jan. 29th.

The following relinquish their comms. on ceasing to be empld.:—Col. H. D. Briggs, C.M.G. (Capt., R.N.), Lt.-Col. R. A. Wilson, D.S.O (Commdr., R.N.), May 15th.

Transferred to unempld. list:—Lt. (Hon. Maj.) (actg. Maj.) H. K. Fayne (R.N.), from (S.O.), April 9th; Sec. Lt. T. H. Bailey, April 19th; Capt. (actg. Lt.-Col.) H. St. C. Smallwood, from (S.O.), April 20th; Capt. H. de B. C. Garfit, from (S.O.), Lt. C. Q. Steel, from (S.O.), May 1st; Lt. T. N. Jennings, from (S.O.), May 9th; Lt. W. Lienard, M.B.E., from (S.O.), May 13th; Capt. C. D. Morrison, from (S.O.), May 26th; Capt. F. V. Shillingfleet, from (S.O.), May 29th; Lt. H. A. Clay, from (S.O.), May 30th; Lt. B. K. O. Mathews, from (S.O.), June 1st.

Capt. M. H. Stephens relinquishes his comm. on account of ill-health caused by wounds, and is permitted to retain his rank, May 28th.

The names and numbers of the following cadets are as now described, and not as stated in "Gazette," May 6th:—154733 D. Anderson, 171994 P. M. Beaker, 2936 C. B. Brame, 128866 Ads. Bullard, 171023 H. Chisholm, 128247 J. Carmichael, 178163 C. J. Du Toit, 178106 H. M. Edwards, 175123 J. W. Gay, 170528 E. R. Gilson, 740 J. G. Goff, 182262 S. G. Livingstone, 178901 U. P. A. Lawrenson, 181840 A. W. Lewis, 176661 H. G. Lovell, 182256 M. D. Miller, 182215 E. J. McIvile, 170664 C. E. Mowatt, 183882 J. T. Macaskill, 184537 F. J. Martin, 182114 L. H. Maytham, 182115 E. G. Murray, 184540 G. R. Muller, 182216 B. Meth, 180378 E. F. Moffatt, 182266 B. S. Mannion, 182267 A. H. Marsh, 184541 R. C. Musson, 176677 L. A. Magennis, 183768 P. H. Mellet, 208 J. F. Maberly, 184567 J. Mackintosh, 184545 J. McLean, 184534 K. M. Mannan, 178241 W. A. McLeod, 182276 C. McAninch, 11154 R. M. McLaren, 9270 W. McLoughlin, 184542 B. L. C. Norton, 137019 F. Olive, 182911 S. H. Oertel, 184544 C. F. Oberhauser, 182195 J. O'Donovan, 180803 E. F. Pett, 181868 W. V. Peacock, 182117 L. F. Perry, 182216 W. G. Paul, 183887 A. T. Povall, 184888 G. C. Pearce, 182276 C. F. Palvie, 182236 J. M. Patrick, 176517 J. Quinn, 182185 J. D. Rossouw, 184548 V. W. Ryley, 182166 E. J. Rocher, 182167 G. C. G. Rocher, 316611 L. B. Rethman, 183893 J. A. Rautenbach, 182170 S. E. Rosebrook, 183697 R. K. Ross, 178207 H. Rothstein, 178620 L. J. de Silva, 182182 A. P. K. Sinclair, 184551 G. G. Southgate, 184552 H. P. Stroud, 183897 T. Shepperd, 182093 L. D. Scott-Moncrieff, 182223 A. C. Sparks, 183202 H. B. Steyn, 183894 E. E. Stuart, 176212 J. B. Struthers, 182534 V. P. de V. Steytler, 183895 W. G. Stafford, 184845 F. J. Schravesande, 137946 V. C. Sheppard, 178213 M. S. Steyn, 183901 D. W. M. Thorrold, 182222 C. E. Taylor, 184777 F. W. Tuck, 183905 E. V. K. Tucker, 183906 C. Tuffen, 182202 V. E. Tuckwell, 183907 H. T. Thomson, 182228 P. Toems, 184550 H. J. Van Graan, 108077 W. K. P. Van Der Spuy, 177765 R. De Verteuil, 10383 N. A. A. Van Buren, 178225 A. L. Wynne, 184560 T. W. Walters, 184562 K. P. Woolmore, 183907 H. T. Wood, 182183 J. B. Wood, 1003 W. R. Wakeford, 4805 B. N. Wainwright, 1141 J. D. Woolfe, 179181 A. G. Webster.

WAR OFFICE, June 9th.

The following is among the decorations awarded by the President of the French Republic to the British Forces for distinguished services rendered during the course of the campaign. The King has given unrestricted permission to wear the Decoration in question:—

ORDER OF NICHAN IFTIKHAR.

Officier.

Temp. Sec. Lt. J. G. Beckham, R.F.C.

AIR MINISTRY, June 10th.

R.A.F.—The following temp. appointments are made at the Air Ministry:—Air Secretary.—Lt.-Col. A. J. L. Scott, M.C., A.F.C., May 22nd, and to be actg. Col. while so empld.

Staff Officers, 3rd Cl. (P.).—Capt. S. Henderson, May 31st, vice Capt. E. V. Andreini.

Staff Officers, 4th Cl. (T.).—Sec. Lt. P. E. Stubbs, April 1st, 1918, and to be actg. Lt. till April 30th.

The following temp. appointments are made:—Staff Officers 1st Cl. (G.).—Lt.-Col. F. H. Kirby, V.C., O.B.E., D.C.M., May 1st, relinquishing the appt. of Group Commander.

Staff Officers, 3rd Cl. (P.).—Lt. (actg. Capt.) T. Gibson, April 10th, and to retain the actg. rank of Capt. until April 30th. (T.).—Sec. Lt. (Hon. Lt.) G. A. Tilly, Feb. 6th, and to be actg. Capt. until April 30th, vice Sec. Lt. (actg. Capt.) A. B. Staples (substituted for the notification concerning this officer which appeared in "Gazette," May 20th).

FLYING BRANCH.—Capt. F. R. Spence to be graded for purposes of pay and allowances as Lt. (K.B.) whilst empld. as Adjt., May 1st.

Capt. S. E. Taylor, D.S.C., to be graded for purposes of pay and allowances as Lt. (A'ship), May 1st.

Lt. (actg. Capt.) E. Burney, M.C., to be Lt. (A.), from (S.O.), April 9th, and to retain the actg. rank of Capt. whilst empld. as Capt. (A.), till April 30th (substituted for notification in "Gazette," April 29th).

Sec. Lt. R. P. Bourne to be Lt., May 4th.

Sec. Lt. G. J. Gawthorne, D.S.M., to be Sec. Lt. (K.B.), from (T.), and to be actg. Lt. whilst empld. as Lt. (K.B.) from June 30th, 1918, to April 30th (substituted for notifications concerning this officer which appeared in "Gazette," Nov. 8th, 1918, and March 11th).

A. Drummond (temp. Sec. Lt., Rif. Bde.) is granted a temp. comm. as Sec. Lt. (A.), Oct. 29th, 1918.

The following relinquish their comms. on ceasing to be empld.:—Lt. C. J. B. Fox (Sec. Lt., D.L.I.), July 13th, 1918; Lt. H. L. C. Aked (Lt., W. Yorks., Capt. Palethorpe, M.C., actg. Capt.), May 1st; Lt. Avery (Cant. Can. Engrs.), Sec. Lt. T. A. Spradbury (Sec. Lt., R. Warwicks. R.), Feb. 4th; Capt. J. Clisdal, M.C. (Capt., Spec. List), April 30th; Lt. H. V. Acland (Lt., Brit. Columbia R.), May 20th; Lt. M. F. Farquharson-Roberts (Lt., R.A.S.C.), Sec. Lt. J. B. Martin (Lt., Brit. Columbia R.), May 27th.

Transferred to unempld list:—Lt. G. R. McIntyre, Jan. 23rd; Lt. W. E. Macpherson, D.F.C., Feb. 8th; Sec. Lt. W. T. S. Cairns, Feb. 15th (substituted for notification in "Gazette," March 28th); Sec. Lt. D. H. Cameron (H.L.I., T.F.), Feb. 22nd; Sec. Lt. L. H. Rice, Feb. 28th; Capt. A. R. Johnston, March 11th; Lt. F. E. Balough, Sec. Lt. R. M. Cruickmyle, Sec. Lt. H. C. Graham, April 1st; Lt. C. Leven, April 11th; Sec. Lt. G. M. Hughey, April 13th; Lt. (actg. Capt.) G. E. Gibbons, M.C., D.F.C., April 15th; Sec. Lt. F. I. Banghart, Sec. Lt. W. D. Bryan, Sec. Lt. J. M. Byrne, April 10th; Lt. W. C. Harveyson, April 26th; Lt. C. C. Cascrell, Sec. Lt. A. Palethorpe, M.C., April 29th; Sec. Lt. J. Lavery (Manch. R., T.F.), May 2nd; Sec. Lt. A. Burns, May 3rd (substituted for notification in "Gazette," May 16th); Sec. Lt. A. McL. Mooney (substituted for notification in "Gazette," May 30th), May 5th; Sec. Lt. F. V. Henderson, May 7th; Sec. Lt. J. W. Haig, May 8th; Capt. F. V. Beauford, May 9th; Lt. E. W. Fletcher, D.F.C. (Essex R., T.F.), May 10th; Lt. A. Y. Moncrieff, May 11th; Sec. Lt. W. E. Hedley, Lt. A. S. Penworth, May 14th; Sec. Lt. A. G. Hilton, Lt. H. J. Paine, May 15th; Lt. A. B. Dees (R.W. Surr. R.), May 16th; Lt. E. S. Dowdall (Lond. R.,

T.F.), May 17th; Sec. Lt. A. S. Hunt, May 18th; Sec. Lt. J. D. Coates, May 19th; Sec. Lt. H. H. Harvey, May 20th, Capt. J. T. Collier, Lt. A. O. Greeves, Sec. Lt. P. Robinson, May 21st; Sec. Lt. E. Turnbull, R.F.A., May 22nd; Sec. Lt. A. P. Besley, Lt. T. D. Cole, Lt. L. E. G. Hawkins, Sec. Lt. W. B. Henderson, Lt. J. A. H. Seyres, Lt. A. T. K. Shipwright, Sec. Lt. T. Stroud, Lt. C. A. J. Thompson (Ches. R.), May 23rd; Lt. F. E. Bond, Sec. Lt. A. G. E. Briggs, Sec. Lt. L. J. Dennis, Sec. Lt. A. S. Fussell, May 24th; Sec. Lt. A. E. Cuthbert, May 25th; Sec. Lt. K. W. J. Oldbridge, Sec. Lt. H. B. V. Vaughan-Evans, May 27th; Lt. W. M. Foster, Sec. Lt. A. L. Mawer, Lt. P. H. O'Neill, Sec. Lt. W. V. Pearce, Lt. C. R. Selman, May 28th; Sec. Lt. F. W. A. Dawkins, Sec. Lt. A. H. Greatrex, Lt. D. H. Oliver, M.C., May 29th; Capt. A. H. Chandler, May 31st; Sec. Lt. F. T. West, June 2nd; Lt. H. E. Duncan, June 3rd; Lt. R. B. Wainwright, June 4th; Sec. Lt. R. Darby, June 5th, Lt. J. G. Aronson, Sec. Lt. D. A. Stenhouse, June 6th (substituted for notification in "Gazette," March 18th); Sec. Lt. H. G. Penwarden, June 7th; Sec. Lt. S. R. Austin, June 10th; Lt. A. K. Prentice relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain the rank of Lt., April 30th (substituted for notification in "Gazette," Jan. 7th).

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—G. J. Ellesmere (contracted on active service), May 20th; T. H. A. Vivers, May 21st; C. G. F. Carver, E. Conning, W. Hodder, May 30th.

The Christian name of Sec. Lt. John Scllars is as now described, and not as stated in "Gazette," May 28th.

The notification in "Gazette," March 11th, concerning Sec. Lt. G. M. Hughey is cancelled.

The notification in "Gazette," May 23rd, concerning Lt J. O. Chantler is cancelled.

The notification in "Gazette," May 30th, concerning Sec. Lt. K. C. Whitwell is cancelled

ADMINISTRATIVE BRANCH.—Capt. L. L. Stevens to be actg Maj. whilst cmpld.. as Maj., from April 14th to 30th.

Sec. Lts. to be Sec. Lts., from (A.) :—C. R. Roushorne, May 9th; G. E. Watson, May 12th.

Sec. Lts. to be Sec. Lts., from (O.) :—H. T. Ecob, May 8th; R. W. Silk, May 12th.

Sec. Lt. R. C. E. Vernede to be Sec. Lt., from (K.B.), April 17th.

The following relinquish their commns. on ceasing to be empld. :—Lt (Hon. Capt.) (actg. Capt.) D. A. G. Dallas (Capt., Ind. Army), Feb. 1st; Sec. Lt. (actg. Lt.) C. C. Campbell, Feb. 21st; Sec. Lt. T. A. P. Proctor (Sec. Lt., Welsh Fus.), April 20th; Lt. J. A. S. Trydell (Lt. K.O.Y.L.I.), May 28th; Lt. M. G. Sykes, May 29th.

Transferred to unempld. list :—Lt. B. M. Machin, Feb. 11th; Sec. Lt. C. H. Dawson, April 10th; Sec. Lt. (actg. Lt.) S. S. Vanderhook, April 14th; Sec. Lt. J. Fenning, April 16th, Sec. Lt. (Hon. Lt.) V. Collins, April 26th; Sec. Lt. A. L. Quarterman-Geal, April 30th; Lt. S. A. Young, May 6th; Sec. Lt. H. B. Walker, May 8th; Lt C. W. Winwood-Smith, May 13th; Maj. H. L. Webb, May 15th; Sec. Lt. D. Craig, Lt. H. Rowbotham, May 20th; Sec. Lt. H. F. Broadribb, Lt. A. H. Tapster, May 21st; Sec. Lt. W. Seddon, May 22nd; Sec. Lt. A. MacKinnon, May 26th; Sec. Lt. R. F. W. Musgrave, Sec. Lt. E. Staples, Jones, R. (T.F.), Sec. Lt. R. C. Sugars, May 28th; Lt E. D. S. Groome, May 29th; Lt. H. A. Birks, June 3rd

Capt. G. R. Page (Lond. R., T.F.) relinquishes his commn. on account of ill-health caused by wounds, May 16th.

Lt. J. S. Sadler relinquishes his commn. on account of ill-health, and is granted the rank of Capt., May 30th.

Sec. Lt. J. Jaffray (Gord. High.) relinquishes his commn on account of ill-health contracted on active service, and is permitted to retain his rank, May 27th.

Sec. Lt. G. A. Beith is removed the Service, his Majesty having no further occasion for his services as an officer, May 17th substituted for notification in "Gazette," May 16th).

The notification in "Gazette," April 11th, concerning Lt F. W. Dogherty is cancelled.

The notification in "Gazette," May 13th, concerning Lt S. H. H. Heaver is cancelled.

TECHNICAL BRANCH.—Capt. B. Thomson to be Capt., Grade (A.), from Grade (B.), March 10th.

Lt. F. N. Trinder to be Lt., Grade (A), from Grade (B), Nov 1st, 1918.

Lt. E. Porter, D.C.M., to be Lt., Grade (B), from (Ad.), May 20th.

Sec. Lts. to be Lts., without pay and allowances of that rank :—W. E. Westwood, Feb. 19th; R. J. Costigan, Feb. 26th, B. A. Gunner. April 2nd.

Sec. Lts. to be Sec. Lts., Grade (A), from (A.) :—E. Barker, March 31st; W. C. Garner, April 23rd.

Sec. Lt T. E. H. P. Kennedy to be Sec. Lt., Grade (A), from (A. and S.), Feb. 22nd.

Capt. F. R. Hardie (Lt., 3rd Hussars) relinquishes his commn. on ceasing to be empld., May 26th

Transferred to unempld. list :—Lt. F. E. Cooper, Feb. 2nd; Sec. Lt. (Hon. Lt.) A. Hunnings, Feb. 11th; Sec. Lt (actg. Lt.) C. E. Ebbutt, Sec. Lt. (actg. Lt.) A. Bullard, April 14th; Sec. Lt. (actg. Lt.) S. R. Francis, Taylor, April 10th; Capt C. N. Hutt, April 26th; Lt. (Hon. Maj.) E. D. Maddick, O.B.E., April 30th; Capt. R. T. Vernon, May 2nd; Lt. N. C. Watt, May 4th; Lt. W. T. W. Wartnaby, May 6th; Capt J. G. Wilson, May 10th; Lt. J. A. Woods, May 15th; Sec. Lt. H. C. Blachford, May 20th; Lt. L. H. Hall, May 21st; Sec. Lt. (Hon. Lt.) A. H. Francis (R. Sussex R.), Lt. W. Randell (Middx. R., T.F.), May 22nd; Sec. Lt. R. C. Bookless, Sec. Lt. E. Redpath, May 24th; Lt. D. Greenwood, May 25th; Lt C. A. Stevenson, May 26th; Lt. A. W. Sutton (D.L.I., T.F.), May 27th; Sec. Lt. A. L. Parry, Lt.-Col. L. Sadler, Maj. T. F. G. Strubell, May 28th; Capt. B. Thomson, May 29th, Capt. W. C. A. Meade, May 31st.

Sec. Lt. B. E. D. Pratt relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Lt., May 30th.

The rank of Capt. L. Crooks is as now described and not as in "Gazette," May 27th.

MEDICAL BRANCH.—C. T. O'Neill is granted a temp. commn. as Lt., June 2nd.

CHAPLAINS BRANCH.—The Rev. J. W. G. Pearse is transferred to unempld. list, May 27th

MEMORANDA.—The following Overseas Cdts. are granted temp. commns. as Sec. Lts. :—154924 J. L. Armstrong, 182171 G. S. C. Airey, 3227 A. G. Arthur, 175104 A. E. Austen, 184508 H. T. Baker, 182140 A. S. Brown, 227681 W. H. Bushe, 264511, T. L. Boney, 171004 P. M. Bealor, 178456 R. M. Black, 184792 F. J. Booth, 185085 C. V. Brain, 182766 C. Barton, 6515 V. J. Back, 190470 E. Boucher, 6039 B. Bryan, 184251 A. Berry, 182282 R. V. Campbell, 872 J. R. Caldwell, 1151 H. Cannard, 184151 J. Cavill, 4102 W. T. Calley, 116050 J. H. Cahitaway, 10445 J. W. Cromrton, 147211 A. W. Criso, 182140 E. Ciotzer, 184005 T. N. Clarke, 254251 P. B. Campbell, 1798 B. J. Carnegie, 128101 A. W. Clark, 64061 A. E. Curtois 187002 C. F. Campbell, 666 J. A. Clarke, 5647 J. N. Cartier, 12564 E. Crowther, 316237 C. E. Cutress, 187093 A. O. Curry, 182153 J. D. Dalrymple, 182258 A. Dickson, 182134 H. H. Denton, 316748 H. E. A. Davey, 667 R. W. Douglas, 254522 V. O. De Costa, 18287 G. H. Dodd, 1495 F. B. Dawson, 188846 G. Dixon, 205665 F. Dircks, 183107 R. S. Elworthy, 6511 C. D. Egan, 110600 S. B. Escourt, 1677 E. W. Eyles, 128343 A. H. Field, 184604 W. Fisher, 339447 G. B. Finlay, 739812 A. K. Fleming, 182244 H. G. Gain, 225238 M. Galgut, 201748 B. E. Grieve, 5775 R. J. Grimsdell, M2/102284 M. Gray, 12276 E. G. Gamble, 4621 C. K. Green, 1099 E. G. Greaves, 137321 E. Gordon-Davis, 121167 W. C. Haslewood, 15345 G. T. Harvey, 6309 L. W. Healey, 3460 G. J. Horton, 154042 B. H. Bowland, 8068 A. E. Hughes, 182595 W. A. Hopkins, 183359 A. L. Henderson, 9339 C. A. Hillary, 183859 F. H. Harford, 184516 S. K. Harrison, 170152 F. Hazlett, 170241 G. F. Hall, 6310 L. H. Hammond, 145628 H. Hughes, R23105 C. W. Hirschbeig, 15409 C. P. Hirst, 2005030 W. M. Jackson, 8764 F. A. Jacka, 107051 H. H. John, 60028 J. G. Jurgenson, 172455 L. J. Kaufman, 184524 L. Kay, 1316587 E. Lundberg, 172084 C. E. Kitching, 182191 B. V. Lambert, 14251 F. Lamport, 81209 P. E. Livingstone, 9063 H. C. Lindsell, 193653 L. P. Lyne, 1247 G. M. Little, 63185 J. R. Lloyd, 1620 G. S. Lownds, 176577 L. A. Magennis, 182702 H. W. Marchant, 180378 E. F. Moffatt, 184309 E. R. Miller, 182114 L. H. Maytham, 184887 J. L. Munro, 184268 P. H. Mellet, 184549 G. R. Muller, 182216 B. Meth, 182113 J. Mansfield, 176724 S. B. Muiler, 183128 W. C. Mitchell, 182264 V. V. Melville, 182115 E. G. Murray, 182144 A. Michelsohn, 182392 A. S. Manchip, 184271 D. J. Muir, 182267 A. H. Marsh, 182215 E. L. Melville, 182293 A. Martin, 182250 E. D. Moses, 182265 A. E. Marshall, 182266 B. S. Mannion, 182509 M. A. Manhire, 182284 E. E. Manchip, 183886 T. W. Mills, 182246 M. D. Miller, 182600 G. A. Morse, 2898 H. B. Morcton, 114553 C. R. Morrison, 327889 W. R. Mott, 407 A. G. Moodie, 182295 W. B. Mills, 181804 C. S. Milne, 184345 L. E. Maher, 184541 R. C. Musson, 184538 C. B. Miles, 176575 A. G. Muir, 182091 P. L. Morris, 208 J. F. Mabcrley, 180499 C. L. Melbye, 1539 J. R. Mitchell, 2827 J. N. Morrison, 184580 C. Mortimer, 183865 R. V. Mansfield, 98322 B. Merrifield, 2990 G. S. Mathie, 184456 J. E. McCarthy, 18388 A. McDonald, 182214 F. A. McKay, 182276 C. McAninch, 9276 W. McLoughlin, 184532 J. V. McNevin, 184532 J. A. McLean 184267 J. Mackintosh, 11054 R. M. McLaren, 182008 I. B. McAdam, 179492 H. W. McFarlane, 316359 F. McCrea, 175272 F. B. McMaster, 182601 A. E. W. McMaster, 316359 F. McCrea, 175272 F. B. McMaster, 182601 A. E. W. McDonald, 183864 J. W. Macaskill, 184531 H. C. McCallum 182251 C. H. McLear, 182602 A. F. McArthur, 184530 W. H. McKenzie 184533 G. G. A. McHardy, 184534 K. M. McLennan, 153812 H. W. McLeod, K/4039 C. W. McGeoch, 1785 S. C. McKenzie, Z/1381 L. A. McLean, 184272 C. N. Norton, 14561 E. W. Naude, 657256 A. P. Nicholson, 195523 B. S. Ottley, 182217 H. Oldfield, 184273 E. P. Oertal, 183584 E. A. O'Connor, 163890 E. C. Polkinghorne, 182093 F. S. Purchase, 183225 A. V. Pickering, 1706 L. Perrinquey, 8920 H. W. Page, 184238 M. F. Perry, 176894 L. Pryce, 1044 R. W. Patterson, 184546 A. M. Porter, 184794 O. B. L. Perrin, 176594 L. D. Penry, 430100 W. W. Pettigrew, 182273 G. P. Pinney, 176494

ORDER OF THE BRITISH EMPIRE.

C.B.E. (Military Division).

Engr. Capt. Robert Boles Garde, R.N.—Services as Engineer Overseer at the works of Messrs J. S. White and Co, and at Sunderland.

O.B.E. (Military Division).

Lt.-Comdr. Leslie Charles Bott, R.N.—Services as Navigating Officer of H.M.S. "Furious."

AIR MINISTRY, June 13th.

R.A.F.—The following temp appointment is made at the Air Ministry :—Staff Officer, 1st Cl.—(Air.).—Maj. F. K. Haskins, D.S.O., May 20th, and to be actg. Lt.-Col. whilst so empld.

The following temp. appointments are made :—Staff Officers, 3rd Cl.—(Air.).—Lt. (actg. Capt.) J. H. Truscott, Feb. 11th, and to retain actg. rank of Capt. till April 30th. (2.).—Capt. A. Smith, June 10th, 1918.

Staff Officer, 4th Cl.—(Air.).—Lt. A. V. Bowbury, May, May 30th.

FLYING BRANCH.—Capt. W. G. Pigott to be graded for purposes of pay and allowances of Maj. (K.B.) whilst empld. as Maj., May 1st

Lts. to be graded for purposes of pay and allowances of Capts. whilst empld. as Capts. :—C. Chrimes (A. and S.), H. Copley (K.B.), May 1st.

Sec. Lt. G. Roberts (late Gen. List., R.F.C., on prob.) is confirmed in rank as Sec. Lt. (A.), July 7th, 1918 (substituted for notification in "Gazette," Nov. 26th, 1918).

G. M. Angier (Lt., R. Suss. R., T.F.) is granted a temp. commn. as Sec. Lt. (A.), Nov. 6th, 1918, and to be Hon. Lt.

A. Cox (Lt., R.W. Fus.) is granted a temp. commn. as Sec. Lt. (O.), Sept. 11th, 1918, and to be Hon. Lt.

Flight Cdt. B. Loutitt is granted a temp. commn. as Sec. Lt. (A. and S.), Aug. 28th, 1918 (substituted for notification in "Gazette," Sept. 10th, 1918).

The following relinquish their commns. on ceasing to be empld. :—Lt.-Col. J. W. Scrddon (Lt.-Commdr., R.N.), June 25th, 1918; Sec. Lt. E. K. A. Biggs (H.L.I.), Aug. 30th, 1918; Sec. Lt. L. W. Hopkins, (Capt., E. Ont. R.), Nov. 18th, 1918; Lt. R. G. Smith (Lt., Manitoba R.), Dec. 9th, 1918; Sec. Lt. G. Hill (North'd Fus.), March 27th; Lt. H. H. Cotton (Lt., actg. Capt., Quebec R.), March 28th; Lt. H. V. Brisbin (Lt., 1st Cent. Ont. R.), April 24th; Lt.-Col. R. B. Davies, V.C., D.S.O., (Lt.-Commdr., R.N.), May 7th; Sec. Lt. (Hon. Lt.) C. R. Fraser (Lt., Can. Engrs.), May 12th; Sec. Lt. (Hon. Lt.) A. A. Creswell (Lt., Sask. R.); Lt. A. C. Holmes (Lt., Newfoundland R.), May 21st; Maj. R. C. Hayes, O.B.E. (Lt.-Commdr., R.N.), May 30th; Lt. J. K. Parker (Lt., R. Scots Fus.), June 14th

Transferred to unempld. list :—Sec. Lt. A. T. Bower, Jan. 28th; Sec. Lt. P. E. Youngs, Feb. 2nd; Sec. Lt. R. C. Macaulay, Feb. 5th; Lt. N. K. Harben, D.F.C., Feb. 14th; (substituted for notification in "Gazette," March 25th); Sec. Lt. H. C. W. Smith, Feb. 15th, Sec. Lt. T. C. Blencowe, Feb. 28th; Lt. E. G. Rumfitt, March 12th; Sec. Lt. (Hon. Capt.) E. E. C. Wilcocks, March 13th; Lt. A. M. Creighton, March 15th; Lt. G. A. C. Manley, March 16th; Sec. Lt. R. Hugo, Sec. Lt. C. A. Schiller, April 1st; Lt. J. Whitehead, April 4th; Sec. Lt. R. Woodhead, April 9th; Lt. (Hon. Capt.) (actg. Capt.) H. N. Whitting, April 11th; Sec. Lt. G. P. Woods, Lt. H. St. J. E. Youens, April 12th; Sec. Lt. L. T. Armstrong, Lt. S. F. Mitchell, April 15th; Sec. Lt. H. Jones, 3rd. Sec. Lt. (Hon. Capt.) H. B. Wilson, D.F.C., April 14th; Lt. J. Oliver (Lord R.), Lt. H. S. Scott (W. Yorks. R., T.F.), Sec. Lt. C. Watkins, April 15th; Lt. E. A. Latter, April 16th; Sec. Lt. E. B. Hyndman, Lt. E. G. Lunn, Lt. C. E. Woolhams, April 17th; Sec. Lt. R. G. Hilton, April 18th; Sec. Lt. J. McL. Campbell, April 19th; Lt. F. L. Willis, April 22nd; Sec. Lt. A. H. Hill, Lt. O. M. Mills, Lt. J. G. Lovelace, Lt. F. Y. Smith, April 23rd; Sec. Lt. H. G. B. Lovatt, April 25th; Capt. E. C. Hutton, Sec. Lt. L. B. Irish, Capt. J. Palethorpe, M.C., A.F.C., Sec. Lt. C. Reilly, May 1st; Lt. N. M. Irvine, Sec. Lt. A. E. Loveday, Sec. Lt. F. L. Wraight, May 2nd; Sec. Lt. A. J. Stammer, Lt. F. C. Yandell, 3rd. Sec. Lt. T. B. Lamble, May 4th; Lt. J. S. Robson, May 5th; Sec. Lt. A. Iredale, Sec. Lt. A. H. Walton, Sec. Lt. B. McL. Williams, May 6th; Sec. Lt. N. M. Ireland, May 7th; Sec. Lt. L. Darche, Sec. Lt. V. R. Scheich, May 8th; Lt. J. S. Mackenzie, Capt. H. R. De Wilde, Sec. Lt. A. H. Watters, D.F.C., May 10th; Sec. Lt. S. Farquhar, May 11th (substituted for notification in "Gazette," May 13th); Capt. M. W. Wilson, Sec. Lt. L. Watney, Sec. Lt. F. E. Winter, Lt. H. G. Yearsley, Lt. G. N. Wilton, May 12th; Sec. Lt. C. Volk, May 13th; Capt G. G. Hubbard, Lt. J. B. Weiss, May 14th; Sec. Lt. C. G. Hitchcock, May 15th; Lt. L. Allden (London R., T.F.), Lt. F. E. Short, May 16th; Sec. Lt. J. McKinty, Lt. F. A. Laughlin, D.F.C., May 18th; Maj. R. H. Carr, A.F.C., D.C.M., Sec. Lt. H. D. Lane, Sec. Lt. M. F. Poulter, Sec. Lt. B. Rogers, May 20th; Sec. Lt. O. W. Clarke, Sec. Lt. H. M. Brettell, Sec. Lt. F. Eppinger (substituted for notification in "Gazette," May 23rd); Sec. Lt. M. B. Tacey, Sec. Lt. A. Leslie, Sec. Lt. W. Shaw, Sec. Lt. H. Shone, Sec. Lt. H. W. Spencer, May 24th; Sec. Lt. P. Atkinson, Lt. N. R. McKinlay, May 21st; Sec. Lt. P. F. Fenner, May 22nd; Lt. A. N. Appleford, Sec. Lt. R. S. Auden, Lt. J. Faulkner, Lt. S. E. C. Lamb, May 23rd; Lt. D. C. W. Sanders, May 24th; Sec. Lt. W. L. Andrews, Lt. W. D. Blatch (Derby Yeo., T.F.), May 25th; Sec. Lt. M. Gorcos, May 27th; Lt. W. A. Hemmings, May 28th; Sec. Lt. J. L. Fisher, Sec. Lt. R. T. Gray, Capt. S. A. Meller, May 31st; Lt. C. K. M. Douglas, A.F.C., Sec. Lt. G. Martin, Lt. N. J. Parkhurst, June 1st; Sec. Lt. P. J. A. Fleming, June 3rd; Sec. Lt. J. R. A. Farfan, June 9th; Lt. R. S. Davey, June 10th; Lt. J. Angus, Capt. R. Irons, June 11th; Lt. W. S. Grace, Lt. F. R. C. Hewitt, June 12th; Sec. Lt. A. S. J. Davies, Sec. Lt. C. G. Goldsbury, June 13th.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—S. V. R. Lewis (caused by wounds), April 24th; J. W. Lockhart (caused by wounds), May 4th; F. J. Gall, May 20th (substituted for notification in "Gazette," Jan. 31st); A. H. Gitsham (contracted on active service), May 30th; K. J. Isaac (caused by wounds), May 31st; R. J. G. Stewart (contracted on active service), June 4th.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—L. L. De Jean, May 31st; W. P. Small, June 4th.

Sec. Lt. R. R. Truscott relinquishes his commn., being physically unsuited for the duties of pilot or observer, Jan. 6th (substituted for notification in "Gazette," Nov. 5th, 1918).

The notification in "Gazette," April 11th, concerning Lt. L. G. Bullock is cancelled.

The notification in "Gazette," May 9th, concerning Lt. F. H. Prime is cancelled.

ADMINISTRATIVE BRANCH.—T. Gibson (temp. Lt., Dorset R.) is granted a temp. commn. as Lt., and to be actg. Capt. while empld. as Capt., from Jan. 14th to April 30th.

Lt. N. F. Bardell to be Lt., from (K.B.) and to be graded for purposes of pay and allowances of Capt. whilst empld. as Capt., May 1st.

Sec. Lts. to be graded for purposes of pay and allowances of Capts. while empld. as Capts. :—H. Gambier, May 1st; (Hon. Capt.) A. N. Wyatt, May 20th.

The following relinquish their commns. on ceasing to be empld. :—Lt. K. Owen (Lt., E. Lancs. R.), Feb. 21st; Lt. M. O'Loughlin (Lt., Conn. Rangers, Spec. Res.), May 26th.

Transferred to unempld list :—Sec. Lt. C. J. V. Bowles, Feb. 28th; Lt. A. H. Cocking, March 12th; Lt. H. I. Pole, April 7th; Sec. Lt. H. W. Hills, April 12th; Sec. Lt. L. J. W. Ingram, April 15th; Sec. Lt. C. A. Henshaw, Sec. Lt. R. Sharples, April 16th; Sec. Lt. L. H. Simmons, April 17th; Lt. K. F. Hilder, April 20th. Lt. O. C. Skinner (10th Lancers, Spec. Res.), April 22nd; Lt. (actg. Capt.) S. E. Tidy (Army Cyclist Corps), April 23rd; Sec. Lt. S. W. Saunders, May 2nd, Capt. A. H. Hulton, May 9th; Lt. G. F. W. Brett (R. Fus.), Sec. Lt. R. A. Shaw, May 10th; Sec. Lt. J. N. F. Spence, May 20th; Sec. Lt. F. Temple, May 21st; Sec. Lt. A. K. P. Ivey, May 22nd; Sec. Lt. E. A. J. Brown, May 23rd; Lt. (Hon. Capt.) H. W. Bunbury, May 26th; Lt. E. K. Ortner, May 30th.

Lt. (Hon. Capt.) G. J. Elliott relinquishes his commn. on account of ill-health, and is granted the rank of Capt., May 30th.

Lt. W. Nuttall relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, May 30th.

Sec. Lt. N. W. Seyler relinquishes his commn. on account of ill-health and is permitted to retain his rank, June 4th.

The notification in "Gazette," April 4th, concerning Lt. J. R. Fuller is cancelled.

TECHNICAL BRANCH.—Capts. to be graded for purposes of pay and allowances of Majs., Grade (B), whilst empld. as Majs :—F. W. Mansell, H. A. Whelen, May 1st.

Lt. R. B. Stephenson to be graded for purposes of pay and allowances of Maj., Grade (A) whilst empld. as Maj., May 1st (substituted for notification in "Gazette," May 27th).

To be graded for purposes of pay and allowances of Capts., Grade (A), whilst empld. as Capts. :—Lt. L. A. Hooper (substituted for notification in "Gazette," May 27th); Sec. Lt. D. M. Rees, May 1st.

To be graded for purposes of pay and allowances of Capts., Grade (B), whilst empld. as Capts. :—Lt. T. C. Penna, Sec. Lt. J. Sutherland, May 1st.

Sec. Lt. J. H. Furniss, O.B.E., to be Sec. Lt., Grade (B), from (Ad.), and to be graded for purposes of pay and allowances of Capt., Grade (B), whilst empld. as Capt., May 1st.

Lts. (O.) to be Lts. :—B. L. Blonley, July 27th, 1918 (substituted for notification in "Gazette," Aug. 30th, 1918); W. V. Hunt, Grade (B), Oct. 1st, 1918 (substituted for notification in "Gazette," June 6th).

Lt. H. T. Thompson to be Lt., Grade (A), from (S.O.), and to retain the actg. rank of Capt., from April 1st, 1918, to April 30th

Sec. Lt. (actg. Lt.) L. G. Bullock to be Lt., March 26th.

Sec. Lt. H. Weller to be actg. Lt. whilst empld. as Lt., Grade (A), from March 20th to April 30th.

Sec. Lt. J. Dale to be graded for purposes of pay and allowances as Lt. whilst empld. as Lt., Grade (A), May 1st.

Sec. Lt. W. W. Hammond to be Sec. Lt., Grade (B), from Grade (A), June 2nd.

Sec. Lt. A. Shepheard (late Gen. List, R.F.C., on prob.)) is confirmed in rank as Sec. Lt., Grade (E), April 17th.

Sec. Lt. J. H. Stone to be Sec. Lt., Grade (A), from (Ad.), Nov. 18th, 1918.

Sec. Lt. E. C. G. Vines to be Sec. Lt., Grade (B), from (Ad.), Nov. 1st, 1918.

Sec. Lt. J. W. McKee (Sec. Lt., R.F.A.) relinquishes his commn. on ceasing to be empld., March 15th.

Transferred to unempld. list :—Capt. F. J. Colet, March 6th; Capt. C. R. Lynn, April 1st; Lt. H. B. Wilkins, April 4th; Sec. Lt. E. Whitmore, April 16th; Sec. Lt. G. F. W. Thomas, April 26th; Capt. G. Hindle, May 3rd; Sec. Lt. J. W. Fry, Sec. Lt. E. Hickman, May 5th; Sec. Lt. A. Potter, May 6th, Maj. C. R. Huggins, May 13th; Sec. Lt. S. H. Child, Sec. Lt. A. Isles, May 15th; Capt. F. de B. Collette, May 16th; Lt. S. Wilson, May 19th; Sec. Lt. W. A. Huntley, May 22nd; Sec. Lt. A. Higham, May 23rd; Lt. E. A. Comeau, Lt. C. A. Drew, Sec. Lt. (Hon. Lt.) N. H. de Y. Heathcote, Sec. Lt. (Hon. Lt.) H. M. Over, May 28th.

Sec. Lt. L. V. Mackenzie relinquishes his commn. on account of ill-health contracted on active service, and is granted the rank of Lt., June 4th.

The initials of O. C. Lees are as now described, and not as stated in "Gazette," May 27th.

The surname of H. D. Staniar is as now described, and not as stated in "Gazette," May 27th.

The notification in "Gazette," March 26th, concerning Lt. (actg. Capt.) R. W. Mitchell is cancelled. The notification in "Gazette," April 8th, to stand.

MEDICAL BRANCH.—W. A. Malone (Capt., R.A.M.C., S.R.) is granted a temp. commn. as Capt., June 1st.

DENTAL BRANCH.—Lt. B. G. Kechnie is transferred to unempld. list, Feb. 5th.

CHAPLAIN'S BRANCH.—The Rev. W. P. Young, D.C.M. (R.A.C. Dept.), relinquishes his commn. on ceasing to be empld., June 14th

MEMORANDA.—The following Overseas Cadets are granted temp. commns. as Sec. Lts. :—171603 G. R. Abraham, 798012 R. W. Anderson, 316087 R. R. Annett, 183669 A. G. Archer, 316236 W. D. Armstrong, 316081 M. L. Ashmore, 316004 R. G. Austin, 153366 R. J. Avriss, 152627 J. Abraham, 453352 H. R. Aikens, 409220 P. L. Apps, 53105 W. S. H. Atkinson, 1208 A. E. Austin, 3303460 G. D. Adams, 316089 W. H. Barton, 154675 G. H. Barber, 316099 H. R. Blackie, 75415 R. E. Banning, 171009 H. Barlow, 154893 R. Barrett, 171352 A. Bartlett, 172266 L. E. Bartlett, 172416 J. W. Baybutt, 172406 E. M. Beckman, 316029 I. S. Bell, 171824 W. Bergman, 174815 G. M. Bernier, 181598 A. R. Beveridge, 172034 W. J. Blackman, 522649 A. E. Blandford, 698397 J. P. Bourgeois, 868003 J. F. Bain, 172511 W. Barclay, 400405 J. Birkenhead, 316198 G. K. Boomer, 316367 G. O. G. Burnett, 150897 J. W. Brown, 172205 R. E. Brown, 512268 E. J. Buckham, 171954 A. H. Burns, 6657 E. H. Butler, 183386 B. O. Browning, 316006 J. E. Briggs, 172007 N. K. Bowman, 782296 K. Buell, 172674 W. J. Burgess, 315320 F. B. Chauvin, 316241 E. E. Chowns, 171967 J. R. Coulson, 316053 R. J. Crane, 316292 J. R. Cruikshank, 172018 C. A. Campbell, 316101 G. Carlisle, 3429999 O. A. Carson, 310868 R. J. Carson, 153345 E. Charron, 2046 R. L. Chevrier, 153984 J. R. Clark, 316016 V. R. Clerihue, 316232 G. E. Collins, 173006 C. Connell, 172553 J. 154554 L. V. C. Coates, 316179 F. D. Collins, 173006 C. Connell, 172553 J. 154554 L. V. C. Coates, 316179 F. D. Collins, 173006 C. Connell, 172553 J. M. Cooper, 347451 A. T. Corner, 696797 W. A. Cory, 154715 H. S. Coulter, 316232 G. E. Collins, 472336 G. G. Carr, 252476 W. R. Chester, 84020 S. M. Coutts, 137059 W. R. Cox, 125167 A. J. M. Craig, 791227 A. F. Crowe, 154771 B. M. Collins, 316102 A. P. Cameron, 510393 A. Coldwell, 50153 W. Charles, 316139 G. A. Clark, 316069 A. V. Clarry, 316221 J. R. Christie, 411138 H. A. Craig, 316265 E. C. Dudley, 171968 C. S. Dryden, 92384 A. E. Dunning, 153173 E. Douglas, 304480 F. H. Duncan, 154366 F. W. Davis, 171929 J. Devereux, 316062 H. H. Dixon, 400732 R. B. Donald, 171542 J. C. Dornan, 316095 J. A. Downton, 524525 R. H. Duncan, 316182 C. W. Del Plaine, 687155 J. F. Dunfield, 310724 G. G. Duncan, 316282 H. Edwards, 316174 R. B. Earley, 310268 I. M. Eastwood, 172829 R. M. Edgar, 171426 Entwelle, 316238 R. L. Esmonde, 316293 W. W. Elliott, 2501166 N. F. Evans, 911873 R. L. Empey, 316354 R. H. Elgie, 110151 F. G. G. Ewart, 1977 M. S. Fellows, 649 W. I. Finlay 154746 F. W. Fairburn, 171974 H. M. Fergusson, 154712 G. F. Fisher, 171359 J. F. Flanagan, 316129 L. E. Garvin, 92726 E. A. Ferguson, 317294 S. Field, 316170 F. W. Friend, 1261632 L. J. Foss, 316353 J. C. Forsyth, 316218 A. G. Galloway, 171602 S. L. Garrison, 183105 G. E. Green, 911769 A. C. Goodman, 79400 A. W. Griffin, 172099 G. B. Gordon, 14559 R. A. Gray, 787626 O. R. Gorman, 171728 R. M. Gray, 212487 F. V. Griffin, 171600 R. E. Guest, 207532 M. H. Gooch, 316221 A. Gillespie, 690693 G. N. Goodman, 155762 R. W. Grant, 766971 J. A. Green, 533494 A. G. Green, 21300 N. H. Grills, 171770 H. Gilker, 316220 T. D. Guernsey, 316039 E. Haynes, 171633 G. Higgs, 316390 C. Hollingham, 316303 S. Horne, 211254 R. D. Hoyt, 513207 S. E. Hill,

527804 E. R. Hooey, 316116 H. L. Huxtable, 171723 E. R. Heppa, 172415 C. H. Hall, 154760 R. S. Hamilton, 89515 R. S. Haraisty, 523621 R. M. Harwood, 316179 G. R. Heaman, 171730 H. E. Heathe 112151 D. Henderson, 316278 A. W. Heron, 070090 A. Hogg, 316344 A. F. Huff, 153772 R. J. Howard, 184107 N. W. S. Hunter, 2527 G. A. Heffernan, 176023 S. T. Harvey, 316234 W. L. Hastings, 316222 H. Hayward, 542174 T. W. Holtze, 173712 S. M. C. Honeyman, 172729 F. V. Hudson, 57020 R. Helland, 153340 E. H. Hanbury, 18 R. S. Hallett, 172057 D. Hannesson, 316263 J. F. Hockey, 172511 K. C. Irving, 171781 R. Johnson, 110269 J. R. Jeffrey, 430271 S. Jones, 316383 W. C. Juniac, 192248 E. F. Jenkins, 154094 C. R. Johnson, 316017 L. A. Jordan, 316254 J. A. Johnson, 316019 E. A. Keeping, 316386 F. V. Keen, 171647 J. E. Kerr, 330865 S. G. Kelly, 154236 A. W. Kerridge, 1258006 L. D. Keating, 172353 A. E. Kerr, 50053 H. A. Kemp, 316384 T. W. Lawler, 6355 J. H. Lewis, 302930 A. C. Laing, 1261379 H. W. Lea, 171792 A. E. Long, 1225 W. C. Lowe, 310245 R. Laing, 348860 C. D. Law, 266 A. G. Lorraine, 316235 J. Lowe, 769132 G. V. Lowrie, 316233 J. G. Lyons, 5028245 J. P. Lafrenboise, 316130 D. L. Ludgate, 315904 S. MacDonald, 316918 J. R. McLeod, 535407 W. McIlquhan, 100673 R. K. McIntosh, 540115 T. D. McSweeney, 171437 J. E. McArthur, 154791 T. T. McBain, 171567 C. J. McCall, 171836 T. W. McClure, 316054 A. M. McCormack, 316177 W. L. McDonald, 154798 H. A. McGill, 171934 W. S. McKeown, 316012 E. B. McMynn, 172717 R. A. McNaught, 433391 S. McL. McNintch, 154967 D. W. McQueen, 6218?? H. G. MacKay, 541229 W. S. McCutcheon, 316241 J. H. McDonald, 316259 D. H. McKeague, 153977 S. A. McLean, 316327 N. P. McDermot, 316299 R. McLanaghan, 127107 T. H. Millian, 81598 C. A. Mitchell, 316279 H. S. H. Moore, 316019 D. J. Moorman, 154891 C. W. Morcan, 5320098 C. F. Moriarty, 171471 F. H. Morren, 154277 A. T. Murphy, 73682 W. H. Martin, 775044 W. H. Metcalf, 153428 S. Musgrove, 316004 D. Mitchell, 316271 G. G. Markle, 316256 H. K. Mason, 504910 J. Menagan, 172751 D. Moir, 487313 L. L. Moore, 67439 D. Morrison, 231151 D. E. Mould, 316266 G. C. D. Norman., 5131?6 J. R. Nind, 316302 C. A. Norris, 525562 G. B. Nicolands, 171004 E. J. O'Farrell, 171557 J. H. O'Connern, 2480307 A. E. Oliver, 270 A. V. O'Meara, 316316 R. G. A. Overing, 654728 C. R. Papst, 171936 F. E. Palmer, 171145 W. C. Tilgrim, 405385 T. V. Phillips, 129501 G. Preston, 802712 T. Prye, 907621 C. M. Partridge, 346822 V. A. Payne, 171457 G. F. Penny, 171125 A. L. Phelps, 154694 H. N. Polley, 364881 A. J. Potter, 172289 E. J. Pilcher, 316058 E. L. Price, 172872 L. N. Peine, 316390 R. S. Pidock, 316356 C. F. Plumb, 184743 C. J. Portsmouth, 316290 C. W. Perrett, 171918 G. S. Routcliffe, 160578 A. B. Reid, 408599 A. L. Robb, 186539 S. McM. Richardson, 316612 J. H. G. Royston, 171587 J. G. Robertson, 316239 J. L. Robinson, 171076 J. Robinson, 171554 J. C. Roger, 316395 E. L. Rose, 171700 W. H. Roxburgh, 316248 S. E. Roe, 540244 W. H. Russell, 316313 J. Rae, 189335 W. J. A. Roulston, 316324 A. H. Roy, 316351 R. C. C. Rolph, 171378 J. G. Reid, 104707 W. H. Spencer, 67426 J. Stark, 316301 J. A. Stephen, 152828 A. F. Styles, 154987 M. D. St. Clair, 171150 J. H. St. Martin, 316031 E. G. Saigle, 154543 L. G. Scheiwetzer, 501371 G. T. Scott, 171?89 E. H. Shaw, 316040 G. Sealy, 316023 A. E. Scon, 171863 A. E. Smith, 171599 J. M. Sowden, 181936 V. C. Spencer, 154275 W. H. Spurr, 171592 G. H. Stadler, 171028 G. L. Stevens, Z.461 E. Stieri, 318961 H. Smith, 534420 L. B. Sears, 303420 C. W. Scott, 1261748 C. L. Shields, 339356 F. G. Solloway, 154817 D. A. Stewart, 171858 A. St. Jean, 171036 C. N. Stevens, 171341 G. C. Sturdy, 151922 R. W. Smith, 92879 W. A. Smith, 659 G. K. Spruit, 316305 W. H. Stanton, 316315 H. C. Startup, 112738 C. E. Summer, 171963 A. V. Trayner, 2134935 R. L. Tindall, 172871 J. M. Tate, 23325 T. W. Tite, 171927 B. Tomkins, 154669 G. M. Tottcn, 488909 C. L. Traise, 1715?0 F. G. Trescott, 418571 J. Turnbull, 21896 F. R. Turnley, 2003600 E. T. Timmons, 172547 J. H. Townsend, 166438 J. M. Thompson, 316386 A. R. Thornton, 301500 W. B. Unsworth, 154773 L. C. Vair, 154319 G. H. Vallett, 223110 D. L. Vincent, 503869 A. Wagstaff, C. J. H. Van Velden, 172576 E. W. Wallace, 316093 A. A. Warren, 128157 E. P. Warren, 152856 J. W. Watts, 316212 W. Wright, 172403 K. M. Wears, 154819 V. S. Webster, 154220 A. L. Wheeler, 1006810 H. A. Wheeler, 8609 J. R. Wight, 148581 J. E. Wright, 50741 H. G. Wrinch, 302 H. Watkins, 316229 E. J. Wain, 183357 H. W. Whistler, 171545 V. B. Whitley, 513672 G. S. Williamson, 478014 H. I. Wilson, 154790 A. E. S. Wintermure, 895270 D. S. Wylie, 316366 A. E. Walker, 316325 L. S. Weldon, 316213 L. B. West, 316256 F. Wright 171370 C. W. Ward, 316166 W. E. Warner, 316352 W. C. H. Webb, 330815 C. S. Weight, 129111 W. H. Wells, 120654 C. T. Welsh, 316306 C. L. Wraith, 316396 V. G. Wrigglesworth, 81176 S. F. Youhill, 185903 G. A. Young, 316277 H. F. Young, Feb. 15th.

Flt. Cdt. 177075 F. Silver is granted an hon. commn. as Sec. Lt., April 9th.

Transferred to unempld. list:—Maj. R. E. Childers, D.S.C. from (S.O.), March 10th; Capt. S. F. Ingram, from (S.O.), April 4th; Capt. A. H. White, from (S.O.), April 16th, 1918; Lt. C. P. Brady, from (S.O.), May 17th; Capt. H. Foord, from (S.O.), June 1st.

Sec. Lt. V. B. Napier to take rank and precedence as if his appointment as Sec. Lt. bore date March 26th.

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, June 12th.

The King held an Investiture in the Quadrangle of the Palace at 11 o'clock this morning.

The following were severally introduced into the presence of His Majesty, when The King invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:—

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE.—Commander.—Military Division.—Lieut.-Col. Charles Randall, R.A.F.

BAR TO THE DISTINGUISHED SERVICE ORDER.—Lieut.-Col. Peregrine Fellowes, R.A.F.

THE DISTINGUISHED SERVICE ORDER AND THE MILITARY CROSS AND BAR.—Capt. Matthew Frew, R.A.F.

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE.—Officer.—Military Division.—Capt. William Hodgson, R.A.F.

His Majesty then conferred decorations as follows:

THE DISTINGUISHED SERVICE CROSS.—Major William Wilson, R.A.F.

THE MILITARY CROSS AND BAR.—Capt. John Burd, R.A.F.

BUCKINGHAM PALACE, June 14th.

The King held an Investiture in the Quadrangle of the Palace at 11 o'clock this morning.

The following officer was introduced into the presence of the King, when His Majesty invested him with the Insignia of the Division of the Order into which he has been admitted:—

THE MOST DISTINGUISHED ORDER OF SAINT MICHAEL AND SAINT GEORGE.—Companion.—Lt.-Col. Hugh Williamson, R.A.F.

The King then conferred decorations as follows:—

THE MILITARY CROSS.—Maj. Eric Crewdson, R.A.F.; Lt. John Cooper, Arg. and Suthd. Highrs., attd. R.A.F.; Lt. Walter Horrocks, R.A.F.

OFFICIAL COMMUNIQUES.

ESTHONIA.

June 9th.—An aeroplane landed near Narva on Sunday, and two others to-day, bearing German nationality marks. The passengers were German officers and soldiers and Baltic Germans who had flown from Riga, and have been arrested.

ADMIRALTY APPOINTMENTS.

The following appointments have been made:—

JUNE 14th.—Surg. Lt. (temp.).—S. O. Rashbrook, to "Ark Royal." June 13th.

JUNE 16th.—Actg. Payr. Sub-Lt.—C. McG. Webb, to "Furious," June 14th.

PERSONAL NOTICES.

NAVAL.

MARRIAGES.

BUTCHER—HODGSON.—On June 16th, 1919, at All Souls, Langham Place, London, Lieut.-Col. Osborne Arthur Butcher, D.S.C., R.A.F., was married to Beatrice Viola, younger daughter of the late Edward Dorman Hodgson, of the Middle Temple, Barrister-at-Law, and Mrs. Dorman Hodgson, of 12, Montpelier Place, Brighton, and The Sycamores, Newick, Sussex.

CLARK HALL—ELIOTT LOCKHART.—On June 11th, at All Saints, Lockerbie, Lieut.-Colonel R. H. Clark Hall, D.S.O., R.A.F. (Commander, R.N.), was married to Lillias, daughter of Colonel and Mrs. R. Eliott Lockhart, of The Hewke, Lockerbie, by the Rev. J. C. Grieve.

MILITARY.

DEATH.

WATERLOW.—Capt. Eric Waterlow (Flight Commander), M.C., D.F.C., 25th Squadron, R.A.F., who was previously reported missing on July 16th, is now officially presumed died on or after that date. He was the son of Herbert and Marian Waterlow, of 154, Gloucester Terrace, Hyde Park, W.2, and had been mentioned in dispatches.

ENGAGEMENT.

DOUGALL—ATHORPE.—The engagement is announced of Mr. Charles Robert Dougall, late of the Argyll and Sutherland Highlanders and R.F.C., only son of Mr. Charles Shirra Dougall, J.P., and Mrs. Dougall, of Dollar, Scotland, and Dorothy Phyllis, elder daughter of Mr. Marmaduke Athorpe, J.P., and Mrs. Athorpe, of Dinnington Hall, near Rotherham, Yorkshire, and granddaughter of the late Mr. Gordon Pyper, of Hantane, Ceylon.

MARRIAGES.

SEAVER—SEAVER.—On June 12th, 1919, at St. George's, Cam, Glos., Capt. Joseph Abbott Seaver, North'd. Fus., youngest son of Capt. Jonathan Seaver, R.A.F., and grandson of the late Thomas Seaver, Heath Hall, County Armagh, was married to Mary Violet, daughter of Rev. William Seaver, Vicar of Cam, and granddaughter of the late Dean Seaver, of Belfast, by the Rev. Jonathan Seaver, B.D., uncle of the bride.

SUGDEN-WILSON—SLOCOCK.—On June 3rd, at All Saints' Church, Marlow, Captain William Hodgson Sugden-Wilson, West Somerset Yeomanry and R.A.F., second son of Mr. Hodgson Wilson and the late Mrs. Hodgson Wilson, of Hexgreave Park, Southwell, was married to Elinor, widow of the late Mr. L. A. N. Slocock, and third daughter of Mr. and Mrs. Arthur Cook, Oaken Grove, Marlow, by the Rev. Canon McKee, assisted by the Rev. O. F Spearing.

YARDE—PARGITER.—On June 11th, at St. Margaret's, Westminster, Capt. Gilbert Ferrers Yarde, R.A.S.C. and R.A.F., eldest surviving son of Mr. and Mrs. J. E. Yarde, of Bedford, was married to Constance Marianne, youngest daughter of the late A. H. Pargiter, of Ceylon, and Mrs. Pargiter, of 11, Victoria Street, Westminster, by the Rev. Jocelyn Perkins.

BIRTHS.

COOK.—On June 13th, at Brafferton Hall, the wife of Lieu W. W. Cook, M.C., R.A.F., of Palmerston North, of a son.

HYDE.—On June 6th, at "Eagle House," Woodford Green, Essex, to Dorothy (née Wayman), the wife of Capt. Frank Hyde, M.C. (late R.A.F.), a son.

SCHOLTE.—On June 8th, at 1, Burgess Hill, N.W.8, to Hilda, wife of Lieut.-Col. F. L. Scholte, C.B.E., late R.F.C.—a daughter.

AIR FORCE.

DEATHS.

INGLEBY.—An aeroplane which ascended from the Castle Bromwich Aerodrome, Birmingham, on June 11th, crashed to the ground, striking a tree in its descent. The pilot, Lieut. Ingleby, R.A.F., was killed and the passenger was injured.

PAULL.—On June 12th, Lieut. Paull, A.F.C., R.A.F., of 34, Princess Street, Chester, was killed while giving an exhibition flight in connection with the Peace Carnival at Worcester. The accident was caused through the high wind, and the machine fell 100 ft. The passenger, an air mechanic, named Ackroyd Bentley, of Halifax, was slightly injured.

ENGAGEMENTS.

BARTON—LEE.—A marriage has been arranged and will very shortly take place between Lieut. C. F. Barton, R.A.F., of Toronto, Canada, and Mary Letitia Driffield Lee, younger daughter of the Rev. Frederick and Mrs. Lee, of Woodton Rectory, Bungay.

CUMMING—MARTIN.—An engagement is announced between Lieut. W. N. Cumming, R.A.F., eldest son of Robert Cumming, 20, Bute Gardens, Hillhead, Glasgow, and Phyllis Maude, youngest daughter of Mr. and Mrs. W. Martin, Inverness Court Hotel (late of Hampstead.)

MARRIAGES.

BURKE—GREEN.—On June 5th, at St. James's Church, Twickenham, S.W., Capt. J. M. Burke, R.A.F., second son of the late M. Burke, I.S.O., of Glasgow, was married to Dorothy, eldest daughter of Mr. and Mrs G. Green, Pelham House, Twickenham, S.W., by the Very Rev. Canon English.

HARTFORD—HARTFORD.—On June 4th, at St. Philip and St. James's Church, Oxford, Major Irving Henry Bibby Hartford, A.F.C., R.A.F., son of the late Henry William Hartford, of Christchurch, was married to Dorothea Ramsay Hartford, of Rossett, Denbighshire, widow of Capt. H. I. St. J. Hartford, the Cheshire Regt., by the Rev. C. Rawlins, assisted by the Rev. C. E. D. Biggs.

MATTHEWS—FITCHIE.—On June 7th, 1919, at Clapham Presbyterian Church, Capt. A. W. R. Matthews (late R.A.F.), son of Mr. and Mrs. A. Ratcliff Matthews, 188, Elms Road, Clapham Park, S.W., was married to Annie Ewan, daughter of Mr. and Mrs. T. Tindal Fitchie, 113, Hambalt Road, Clapham Park, S.W., by the Rev. J. Smyth Wood, M.A.

BIRTHS.

CUNNINGHAM.—On June 8th, at 7, Milton Road, Eastbourne, the wife of Lieut.-Col. A. D. Cunningham, R.A.F., of a daughter.

FLETCHER.—On June 12th, at Iveing Cottage, Ambleside, the wife of Lieut.-Col. J. N. Fletcher, A.F.C., R.A.F., a son.

MORTON.—On June 4th, at 7, St. John's Park, Blackheath, Joan, the wife of Major Rowland Morton, R.A.F. (née Watkins) of a daughter.

SEEDHOUSE.—At Dundee, on June 12th, Elspeth Anderson, wife of Capt. C. N. Seedhouse, R.A.F., of a son.

TURNBULL.— On June 3rd, at 12, Adelaide Terrace, Truro, Cornwall, Ethel Muriel, (née Dowsing), wife of R. B. E. Turnbull, late R.A.F., of a daughter.

AVIATION IN RUSSIA.

On June 8th British seaplanes on Lake Onega attacked four Bolshevist craft of unarmed type with bombs. Although no direct hits were obtained the seaplanes succeeded in silencing the anti-aircraft gun-fire by machine-gunning the gun crews. The Bolshevists fled along a zig-zag course, the seaplanes in pursuit.

A Bolshevist wireless message, undated, which deals with the capture of Ufa on June 9th by the Red troops, states :—

Our aeroplanes took part in the fighting for the first time during the campaign, during the crossing of the river Bielaya.

A British naval officer who has just reached London from the Black Sea, where he has been in close touch with General Denikin's administration, describes the valuable help which the British Government is giving to the Volunteer Army.

When he left Ekaterinodar there were lying on the quays and in the warehouses munitions, guns, clothing, tanks, aeroplanes, etc., to the value of some £17,000,000.

British instructors who have been training Denikin's soldiers say that they show great aptitude, both in aviation and in working the tanks.

A large British aviation centre has also been established at Ekaterinodar.

THE AERIAL DEFENCE OF THE BRITISH EMPIRE.

On June 5th in the Union House of Assembly Col. Mentz (Acting Minister of Defence), stated that the Imperial Government will present a number of aeroplanes, not exceeding one hundred, to any of the Dominions wishing to establish an aerial defence.

Concerning the above offer, New Zealand does not seem so keen on accepting it. Sir J. Allen, Minister of Defence, says that the offer represents about £500,000, but its acceptance depends upon the policy of the New Zealand Government, which has not been determined.

ATHLETICS IN THE R.A.F.

The Army will oppose the Royal Air Force in a two-day match to be played at Lord's on Friday and Saturday next (June 20th and 21st), in aid of the funds of the Chevrons Club. Both Services have strong teams.

THE DEMOBILISATION OF THE W.R.A.F.

A certain number of the immobile members of the Women's Royal Air Force are being demobilised. These women are less useful to the Force than the mobile section; if one station closes they cannot be transferred to another, as they live in their own homes. Some of them are married women whose husbands have been demobilised; others are returning to their civilian occupations.

About a month ago a detachment of the W.R.A.F. were sent to France for the first time. There are also some with the Army of Occupation in Germany, these being mainly clerks, cooks, and mess orderlies.

A COURT-MARTIAL.

A general court-martial was held at Upton-by-Chester on Lieut. Edwin Arnold Clear, M.C., R.A.F., who pleaded not guilty to a charge of low-flying at Chester, and guilty to a charge of escaping from arrest at Shotwick aerodrome. While taking exercise in the charge of another officer it was stated that he got into a machine and flew to the Isle of Man.

Accused told the Court that the officer commanding the station had told several pilots that they had "got the wind up." "This got my goat," added accused, "so I went up."

The findings of the Court will be promulgated.

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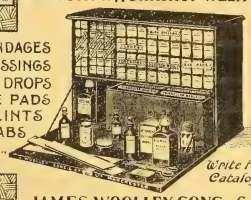
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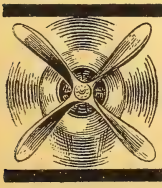
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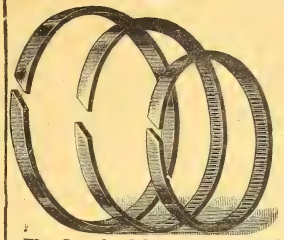
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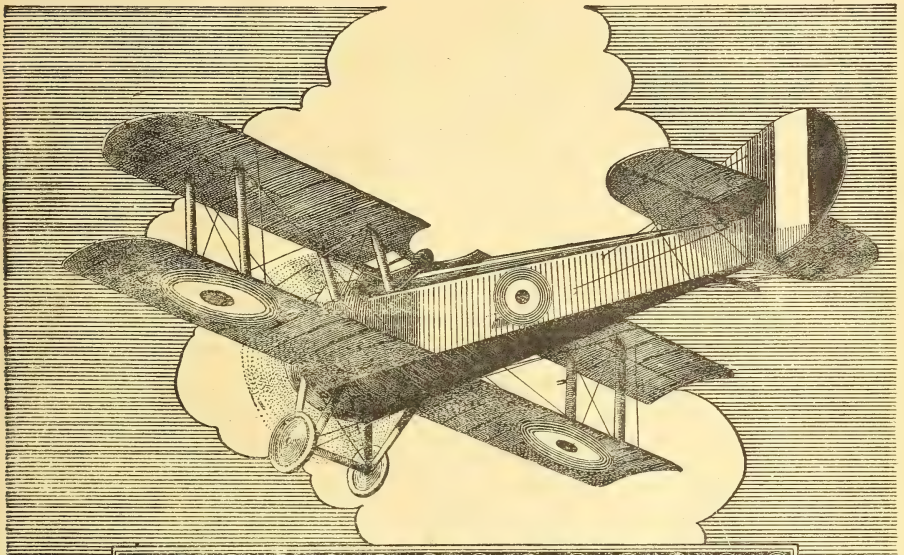
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ON A STUDY IN CONTRASTS.

The past week has been somewhat remarkable, in that it has displayed the British Nation at its best and at its worst. With a splendid sense of the fitness of things the honour of knighthood has been conferred by the King himself on the winners of the trans-Atlantic Competition. By an action which is typical of the congenital imbecility of our Government Departments the Air Ministry has prevented British Industry from obtaining an advertisement which would have followed fittingly on the achievement of Sir John Alcock and Sir Arthur Brown.

The conferring of these knighthoods is Royal in thought and deed. It places the trans-Atlantic fliers definitely in the same class as our famous Arctic and Antarctic explorers, where, curiously enough, this paper placed them some weeks ago. This country has had from time to time a fine array of adventurous, or, as Mr. Churchill might say, audacious, men who have won knighthood by performing some dangerous feat which was of little immediate practical value except for the fine example which it set to the youth of the country.

Sir John Alcock and Sir Arthur Brown rank with the Franklins, McClintocks, Scotts, Shackletons, Stanleys, and Burtons of years now past. It is so unusual in these democratic days to hear of a man being knighted for doing something instead of doing somebody that the idea of the trans-Atlantic fliers being knighted never seems to have occurred to anybody. It would have seemed far more in keeping with modern practice if the Cabinet had recommended a knighthood for the Mayor of Euston, or some such civic functionary who received them on their arrival in London.

Yet a knighthood is eminently the fitting reward of men who have not merely served their country by setting a fine example to adventurous youth, but have served their King in the field. Happily the first two men to be knighted for aeronautical work, and civil aviation at that, are thus far removed from the war-profiteers, brewers, distillers, grocers, theatrical mummers, music-hall artists, lawyers, newspaper persons, and politicians —to put them approximately in order of importance— for whose sake the honour of knighthood has been prostituted of late years.

Our International Courtesy.

The rapidity with which affairs have moved in thus honouring those so deservedly honoured casts into heavy relief the apathy with which this country received the American Naval officers of the N.C. Squadron, who, after all, were the first people in the world to cross the Atlantic by air.

Captain Alcock and Mr. Brown—as they were—arrived in London on Tuesday of last week, and were accorded a welcome by the populace only a trifle inferior to that accorded to Mr. Hawker and Lieut.-Commander Grieve. On the Friday they were entertained by the Northcliffe Press, and were met by the fine flower of our commercial notability—surely a high honour. On Saturday they were received by His Majesty the King and were knighted. On Monday they were banqueted by the Royal Aero Club.

The flying officers of the Navy of our Allies, the United States, arrived in London on a Sunday, and were met by a scratch crew from the Royal Aero Club, whipped up in a hurry by one member—an ex-Lieut.-Colonel R.A.F., who happens to be a friend of Commander Towers. On the following Thursday they were invited to an informal lunch given personally by the Under-Secretary for Air. On the same night they went to a subscription dance somewhere in Bayswater direction, got up by their friend of the Royal Aero Club.

On the Monday they were privately invested with the Air Force Cross by the Under-Secretary for Air, who, whatever may be his faults, seems to have been the one official person who took any interest in them. At no time did the Government, the Royal Navy, the Royal Air Force, the Royal Aero Club, or the Royal Aeronautical Society pay them the compliment of inviting them to a full-dress function.

That is merely by way of illustrating the contrast between our official methods when we do anything ourselves and when it is done by another nation. It is so likely to enhance our reputation as sportsmen.

Another Contrast.

None can deny that the Air Ministry has done all it could to make the trans-Atlantic flight a success, both before and after the event. But when one comes down to more practical matters of immediate commercial value one finds a contrast as remarkable as that between our methods of receiving our own heroes of the air and those heroes who were made in America.

After demonstrating and advertising to the full the success of a British aeroplane and British engines in the longest non-stop flight in history it would seem natural that everything possible should have been done to acquire for British products an equal advertisement in the matter of speed, pure and simple.

An excellent opportunity offered itself in the Aerial Derby which was to be flown the very week in which the winners of the Atlantic competition arrived in England. Naturally one would have imagined that the Air Ministry would have done its best to help in making that speed competition a worthy pendant to the Atlantic flight. French and Italian aeroplanes and engines had been putting up speed and altitude records and advertising them to the world at large. Here was the chance of proving that on this side of aviation also British aircraft could hold their own.

The Air Ministry Way.

But no! Such is not the Air Ministry's way. Instead of encouraging the competition, it put its foot down heavily, and forbade the use of any machines and/or engines ordered by the Air Ministry, whether the engines and other material were supplied by the Ministry of Munitions or were merely bought by the makers.

This barred at least six of the fastest machines in England and possibly in the world. The makers offered to buy the machines and engines from the Government at the contract price, or alternatively to replace them with others. The Air Ministry refused point-blank to do a deal of any sort. Sir John Alcock and Mr. Hawker —among other crack pilots—were barred from competing. Consequently the firms had to turn out their pilots on touring machines or second-string mounts, which put up a speed of about 125 miles an hour round the course instead of an expected 160 miles an hour.

And so the British Aircraft Industry was deliberately deprived of an advertisement which would have had excellent effect abroad as propagandist work, and would have re-acted ultimately with good effect on British Trade as a whole.

WHY?

Of course one cannot expect the Air Ministry as a body to take any interest in mere commercial aviation. And one at once acquits General Sykes, the Controller of Civil Aviation, of any suspicion of having been concerned in this absurd and detrimental order, if indeed he ever knew anything about it. The order came from the Technical side—that dire department which seems as determined to ruin Civil Aviation in Peace as it was to ruin our Flying Services during the War.

The assumption is, further, that it did not come from the Research department, for the order did not affect research so much as supply. Therefore it would seem that it is the Supply department which raised the objection. And one is forced to ask why?

It cannot be that the machines were wanted for the R.A.F., for practically all flying has been stopped by an order which is supposed to effect economy in the use of petrol and the abuse of machines. The Air Force does not fly in these days. It merely accepts machines and then burns them or breaks them up. And it has cancelled almost all contracts for future deliveries. In fact, it is emulating with remarkable success the pre-war cavalry who had no horses and manœuvred on its own flat feet.

What then is the reason? One ingenious person advances the theory that most of the barred machines are fitted with engines about which certain royalties are in dispute with the Air Ministry, and that if these machines had put up big performances the engine-makers' claim to royalty fees would have been considerably strengthened. But one scarcely believes this theory. It is too much like a sound business reason.

A far more likely reason is simply that the makers of the machines entered them for the race without humbly asking leave of some petty, or at any rate petty-minded, official in the Supply department, and that this official determined to punish these mere tradesmen for daring to omit this tribute to his dignity. The fact that the majority of the pilots of such machines would have been war pilots who served the King on active service while the official was wearing his trousers shiny on an office chair would make no difference to such an official. In fact it would rather aggravate the offence, for above all things the dignity of the office chair must be impressed on the mere fighting man.

Such then would seem to be the only possible explanation of this strange order. But it is evident that whether such be the true explanation or not, the matter must be carried further and the Air Ministry must be asked to give an official reason for its action.

CIVIL AVIATION AND THE AIR MINISTRY.

Until war breaks out again it will be well for the Air Council to remember that it is the servant and not the master of the Nation, and to impress this fact on its subordinate officials.

One's chief aim and object in life is to see the R.A.F. the greatest of the King's Services. One remembers that the R.F.C. suffered grievous loss in this war owing to the bigotry, officiousness, and crookedness of Government officials and owing to the lack of a strong and adequately large Aircraft Industry. It is one's duty to see that no such fate befalls the R.A.F. in the next war.

One has played a humble but one hopes a not inconsiderable part in the breaking of certain incompetent officers and officials during the past three or four years, and one will take supreme pleasure in helping to break a few more if the new Air Ministry shows any signs of following in the footsteps of the late Department of Military Aeronautics or of the Admiralty Air Department.

The Department of Civil Aviation is conducting itself in a way which is calculated to hinder the progress of aeronautics and to harm the Aircraft Industry. The Department of Research and Production is likewise acting in a way which seems likely to prejudice the welfare of the R.A.F. and of the Industry. The Controllers-General of those departments will be wise in their own interests as well as in those of the State if they investigate the work of their minor officials more closely than they appear to be doing at present.

So far one has given merely a general outline of the contrasts in our methods in this country. One hopes to tackle the subject in greater detail at an early date, just by way of assisting the heads of departments to set their houses in order. Meantime one hopes that so much as one has said may help in the right direction.

C. G. G.

THE ADVISORY COMMITTEE ON CIVIL AVIATION.

The Air Ministry made the following announcement on June 23rd:—

The Secretary of State for Air has appointed a Standing Advisory Committee on Civil Aviation, with the following terms of reference:—

To advise and report to the Secretary of State for Air on the best method of organising Imperial air routes and on such other subjects relating to civil aviation as may be remitted to the Committee by the Secretary of State.

The Committee will be composed as follows:—

Lord Weir of Eastwood, late Secretary of State for the Royal Air Force (Chairman).

Lord Inchcape of Strathnaver.

Sir James Stevenson, Bt. (member of the Army Council and member of the Air Council).

Colonel J. T. C. Moore-Brabazon, M.P.

The Chairman of Lloyd's (Mr. Charles Irving de Rougemont).

The Chairman of the Society of British Aircraft Constructors (Mr. H. White Smith, C.B.E.).

Mr. L. Bairstow, F.R.S.

The Chief of the Air Staff (Major-General Sir Hugh Trenchard, K.C.B., D.S.O.).

The Controller-General of Civil Aviation (Major-General Sir F. H. Sykes, K.C.B., C.M.G.).

The Secretary of the Air Ministry (Sir Arthur Robinson, K.C.B., C.B.E.).

Secretary of the Committee, Mr. F. G. L. Bertram, O.B.E., Air Ministry.

Sir James Stevenson, Bt., will be the Vice-Chairman of the Committee. The Committee will have the power to co-opt such additional members as may be thought desirable for the discussion of any particular question remitted to them.

THE ROYAL NAVAL, MILITARY AND AIR FORCE TOURNAMENT.

The Royal Naval, Military, and Air Force Tournament opens on Thursday, June 26th. The Royal Air Force will exhibit a Fokker biplane, but it has not yet been stated what part they are to play in the Tournament.

ON THE REGULATION OF CIVIL AVIATION IN THE BRITISH ISLES.

(PART VI AND LAST.)

The last of all the Schedules of the Regulations deals with the rules as to aircraft arriving in or departing from the United Kingdom. In this case, as in the last, one proposes to interpolate remarks where necessary. The Regulations read thus :—

SCHEDULE VIII.

Rules as to Aircraft Arriving in or Departing from the United Kingdom.

PRELIMINARY.

1.—(1) For the purposes of the rules in this schedule the following aerodromes are appointed aerodromes, that is to say :—

New Holland, Lincolnshire ;
Hadleigh, Suffolk ;
Lympne, Kent ;
Hounslow, Middlesex.

Provided that the Secretary of State may by directions add any aerodrome to the list of appointed aerodromes or remove any aerodrome from that list.

(2) For the purposes of the rules in this schedule—

"Importer" has the same meaning as in the Customs Consolidation Act, 1876 ;

"Commissioners" means Commissioners of Customs and Excise ;

"Examination station" means a space at an appointed aerodrome approved by the Commissioners as an examination station ;

"Pilot" includes person in charge.

Other expressions have the same meaning as in the general provisions of these regulations.

The first thing that strikes one is that there is no provision whatever for seaplanes coming to this country from France, Belgium, Holland, Denmark, or Norway—all of which countries will, one hopes, be in regular communication with us by seaplane service this year. One would have expected that Dundee, the Forth, the Tyne, the Humber, Harwich, the Thames, Folkestone, Eastbourne, the Solent, and other localities farther West would have been specified as alighting places for seaplanes.

It is true that "the Secretary of State may add any aerodrome to the list," but the entire omission of ports of entry for seaplanes from the original list indicates a sloppiness of mind and method which has not only been characteristic of the Air Ministry throughout the war, but seems to be the outstanding feature of these Regulations. The two things required to make Civil Aviation a success are intelligence and thoroughness, and they are precisely the characteristics which are most obviously lacking from these Regulations.

Even the list of land aerodromes is sufficiently absurd. Who, for example, is going to fly a land machine across the North Sea and land at New Holland, right opposite to Hull? And, if anybody were fool enough to make such a trip on a land machine, would he want to land on the wrong side of the Humber, at a place where it would take him nearly as long to get to Hull by land and water as it had taken him to cross the sea by air?

Also, who would fly right round London to Hounslow for the fun of a ten-mile journey back again into London unless forced to do so by an idiotic regulation? Hendon is miles nearer. And Cricklewood is nearer still, with better communications than either. Furthermore, if it is desired to have a "foreign" terminal aerodrome well outside London for some reason or another, why not have it at least on the line from the Continent to London, as, for example, at Biggin Hill or Croydon? Why, in the name of common sense, make a man at the end of a long journey fly ten miles past his destination and give him the trouble and expense of coming back again?

One had to put up with the methods of the late Bolo Pasha during the war, but we are certainly not going to stand anything of the sort in time of peace, so people at the Bolo House who are merely there because they cannot find jobs in a competitive commercial life had better make up their minds right now that they will have to get on or get out.

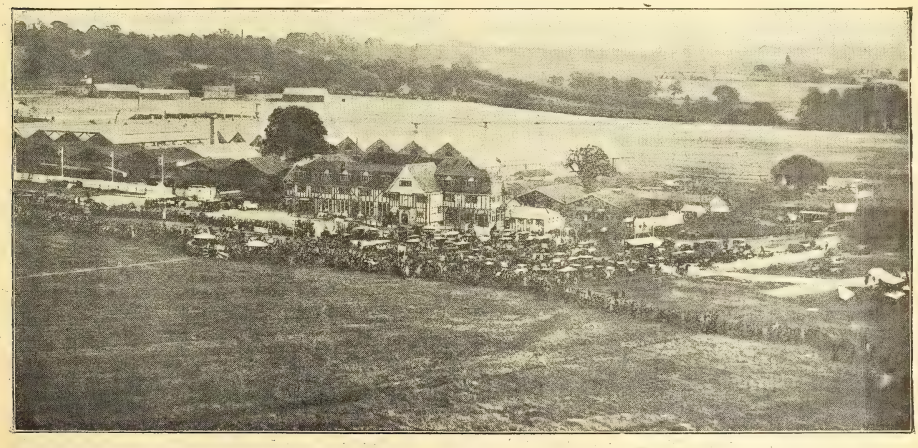
Let us now proceed to details :—

ARRIVAL AT AND DEPARTURE FROM APPOINTED AERODROMES.

2. No aircraft entering the United Kingdom from abroad shall land for the first time in the United Kingdom except at an appointed aerodrome : Provided that this rule shall not apply where an aircraft is compelled to land before arriving at an appointed aerodrome, owing to accident, stress of weather, or unavoidable cause, in which event the procedure laid down in rule 21 (hereafter) will be followed.

3. No aircraft shall fly to a place outside the United Kingdom unless it has departed from an appointed aerodrome.

4.—(1) No person in any aircraft entering the United Kingdom shall carry or allow to be carried in the aircraft—



HENDON AS IT IS.—The crowd at the Aerial Derby. Tpseudo-Swiss chalét is the mess-pavilion. Behind it are the Grahame-White Works. The old gate to the enclosure is on the extreme right.

(a) any goods the importation of which is prohibited by the laws relating to Customs;

(b) any mails, except with the permission in writing of the Postmaster-General.

(2) No person in any aircraft entering the United Kingdom shall break or alter any seal placed upon any part of the aircraft or upon any goods therein by a Customs officer at the aerodrome at which he departed for the United Kingdom.

5. No aircraft shall enter or leave the United Kingdom, having any secret or disguised place adapted for concealing goods.

The intention of these rules, like all the rest, is good. Hell, one remembers, is paved with good intentions. As regards paragraph 2 the meaning is clear, though the "Lincoln Imp" twisted the wording recently with his usual impishness.

Paragraph 3 is less clear, besides being less easily enforced. Does it mean that no machine starting from a private aerodrome—for example—may go outside the "three-mile limit"? It seems as if the destination of a machine which leaves the United Kingdom, whether from an "appointed aerodrome" or any other, is rather the affair of the nation in whose territory it alights. There is, for instance, the classic case of Mr. Biheller (if that is how the sportsman spells his name) who left an "appointed aerodrome" during the war and landed right away off the prescribed course—but that is another story, which deserves to be told all by itself after the Peace Treaty has been signed.

Sub-section (b), paragraph 4, might well be more specific. What precisely constitutes "mails"? May the pilot (including the person in charge) of an Orient Air-liner bring gifts of gold, frankincense, and myrrh from the O.C. an air station in Persia to his best girl in Tooting? Or may he bring butter (on or not on a lordly dish) from Brittany—as was the custom of ferry-pilots during the war. Or may he bring ivory, apes, peacocks, or rabid dogs? The last-named would come under another ban, but none would appear to come within the province of the Postmaster-General.

Paragraph 5 suggests subject-matter for a whole article on aerial smuggling. One must really tackle it at some future date, for the benefit of the Custom House. Think, for one thing, of the possibilities of bladders full of liqueurs in the petrol tanks, or of hollow struts full of saccharin. The Customs officials at the "appointed aerodromes" are going to have such a busy time when commercial flying becomes common.

6. The pilot of any aircraft arriving at an appointed aerodrome from a place outside the United Kingdom shall, on landing, forthwith take his aircraft to the examination station at that aerodrome; provided that a pilot shall not be deemed to have contravened or failed to comply with this rule if he proves that circumstances over which he had no control prevented him from taking his aircraft to the examination station, and that, after the report required by rule 7 (hereunder) had been duly made by him, all goods carried in the said aircraft were removed to the examination station in the presence of an officer of Customs and Excise or some person duly authorised by the Secretary of State.

7. Within twenty-four hours after the landing at any appointed aerodrome of an aircraft from a place outside the United Kingdom the pilot shall—

(a) make a report to the proper officer of Customs and Excise in the form prescribed by the Commissioners; and

(b) truly furnish the several particulars required by such form; and

(c) deliver to such officer with such report his log book, manifest, and declaration of the goods on board his aircraft signed by the proper Customs officer at the aerodrome from which he departed for the United Kingdom; and

(d) land at such aerodrome for examination of baggage all passengers carried in such aircraft, and, after making such report shall produce, and, if required to do so, shall land, all goods in such aircraft for examination.

These Rules call for no special comment, beyond pointing out to future commercial pilots that besides all the log-books prescribed in the earlier Regulations they will have to deal also with "manifests," "Customs declarations," "way-bills," "clearance certificates," and so forth (section (c), paragraph 7, and section (d), paragraph 10), so that they will be wise to take a short course at a commercial correspondence school before starting out as pilots (including persons in charge) of commercial aircraft.

8. If at any aerodrome or other place within the United Kingdom goods or passengers are loaded for conveyance by air to an appointed aerodrome, the pilot shall obtain from the proprietor of the aerodrome of departure a certificate of departure in the form prescribed by the Secretary of State and the Commissioners, and on arriving at the appointed aerodrome the aircraft and all goods and passengers carried therein, shall, on production of such certificate, be exempt from inspection by an officer of Customs and Excise, unless such officer has reason to suspect that the aircraft has, since the issue of such certificate, called at a place outside the United Kingdom.

9. The pilot of every aircraft in which goods are to be exported shall, before any goods be taken on board, deliver to the proper officer of Customs and Excise a notice of departure for a foreign destination in the form prescribed by the Commissioners, in which shall be truly stated the particulars required by such form.

10.—(1) Every pilot of an aircraft carrying goods to any place outside the United Kingdom shall deliver to the proper officer of Customs and Excise at an appointed aerodrome, together with any log books belonging to the aircraft, an application for clearance from that aerodrome in the form prescribed by the Commissioners, in duplicate, and also, if the aircraft carries any goods, a manifest and declaration in the form prescribed by the Commissioners, declaring the goods and stores on such aircraft, and shall truly state therein the particulars required by such forms respectively; and such forms, when signed by such officer, shall be the clearance and authority for the aircraft to proceed to its foreign destination.

(2) No pilot shall depart in any such aircraft from the United Kingdom until he has obtained such authority, or shall, after obtaining such authority, call at any other place in the United Kingdom before proceeding to his foreign destination. Any pilot intending to land at one or more appointed aerodromes before proceeding to his foreign destination shall apply for the said clearance and authority at the last appointed aerodrome at which he lands.

These Rules seem a trifle complicated, but they appear to have been drafted by somebody who understands his job—which is unusual in Air Law.

Paragraph 8 introduces a seemingly unnecessary complication. It means apparently that if an aircraft flies up from Plymouth and lands at Hounslow it must carry the prescribed "certificate of departure," otherwise the passengers' luggage will be searched by the Customs officers. But if it lands at Hendon, or Brooklands, or Cricklewood, it need not carry such a certificate and is not liable to search. The moral is:—"Don't land at Hounslow if you are flying within the British Isles.

Section (2), paragraph 10, seems likely to be rather a nuisance. If one starts from Hounslow for Hamburg, complete with clearance certificate as fitted, and finds after a few miles that a plug is misfiring, or that a terminal is loose, or that one has forgotten one's handkerchief, one may not land at Hendon, or Croydon, or Sutton's Farm, or Joyce Green, to remedy the trouble. One must either carry on, or else if one comes down one must go back to Hounslow or go on to Lympne (which, by-the-way, is pronounced Limm—one believes) and go through all the Customs formalities again, and get a fresh clearance certificate.

IMPORTATION, ENTRY, AND UNLOADING OF GOODS.

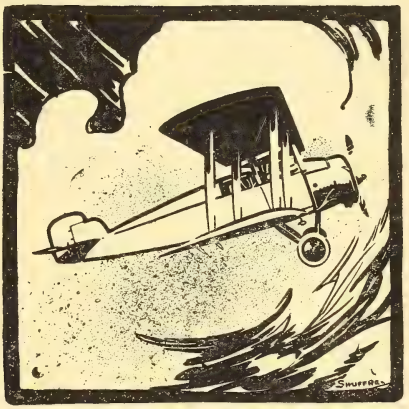
11. No person importing goods in an aircraft shall bring the goods into any place in the United Kingdom other than an appointed aerodrome, or shall unload the goods from any aircraft except at an examination station (unless such goods are unloaded in the presence of an officer of the Customs and Excise under the provisions of rule 6 above) and shall not unload the goods except between such hours as the Commissioners prescribe, or remove the goods from an examination station unless the goods have first been duly entered in manner provided by these rules and produced to the proper officer of Customs and Excise and duly cleared by him.

12. No person shall remove from any aircraft any goods imported therein until the report required by rule 7 (above) has been made, and the authority of the proper officer of Customs and Excise has been obtained.

13. The importer of any goods imported in aircraft shall deliver to the collector of Customs and Excise in whose district the aerodrome of importation is situated an entry of such goods in accordance with the provisions of the Customs Act, and shall truly furnish thereon the several particulars required by the form

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of entry, and shall pay to such collector all duties chargeable thereon at the times and in the manner prescribed by the said Acts; provided that no entry shall be required in respect of diamonds or bullion or the baggage of passengers.

14. All goods imported into an appointed aerodrome in any aircraft shall be duly entered and unladen within seven days from the time of the arrival of such aircraft at that aerodrome or within such further period as the Commissioners may allow.

15. All goods imported in aircraft which have not been examined and cleared by the proper officer of Customs and Excise shall be stored in a transit shed at the appointed aerodrome, and no person shall remove such goods from the transit shed before examination and clearance by such officer.

This is all in accord with shipping practice and quite sound in principle. Paragraph 12 may also be interpreted as a warning to souvenir-hunters that they must not loot crashed machines which have come in from overseas. They may take away bits of the pilot's corpse according to custom, and all the aeroplane itself. But they must not "remove from any aircraft any goods imported therein."

EXPORTATION OF GOODS.

16.—(1) The exporter of any goods intended for exportation in aircraft shall deliver to the proper officer of Customs and Excise at the appointed aerodrome from which such aircraft is cleared to its foreign destination, an entry in the form prescribed by the Commissioners, and shall truly state in such form the particulars hereby required; and such form when signed by the proper officer of Customs and Excise shall be the clearance and authority for the exportation of such goods.

(2) No person shall export goods on such aircraft until such authority has been given by the proper officer of Customs and Excise.

17. No person shall without the consent of the proper officer of Customs and Excise unload from any aircraft any goods loaded thereon for exportation which have been cleared under rule 16 above, or open, alter, or break any lock or mark or seal placed by any officer of Customs and Excise on any goods in any aircraft about to depart from the United Kingdom.

This again is in accord with shipping practice and calls for no comment.

GENERAL PROVISIONS.

18. No person shall make any signal to or from an aircraft entering or leaving the United Kingdom except such signals as are authorised by these regulations; provided that no offence shall be deemed to be committed under this rule if the person making such signal proves that the signal was not given for the purpose of evading or of assisting any person in evading these rules.

That is to say, if the pilot (including the person in charge) of an aeroplane going overseas signals "Cheerio, Old Egg!" or some such term of endearment, to his fiancée as he passes over Balham, *en route* for Buda-Pesth with supplies of Government clothes for perishing Bolshevists, he may be brought down by anti-aircraft fire at the coast and compelled to land at Lympne (pronounced Limm) and held in custody till he has convinced our Democratic Government that his signal is not part of a plot to smuggle Austrian aristocrats back into their own proper places.

19. If any officer of Customs and Excise in the execution of his duty boards any aircraft in any place, the pilot thereof shall not convey him in the aircraft away from such place without his consent.

Here is the first gleam of real humour in all the Regulations. The drafter of paragraph 19 must have been reading Mr. Kipling's "Steam Tactics." One can imagine an aerial Kipling, assisted by the immortal Hinchcliffe and Pyecroft, becoming thoroughly annoyed with an interfering Customs officer and taking him off to some weird corner of the Continent with them, as they transported the Sussex policeman to Wootton Hatch.

It is almost a pity that such a lovely plot for a story should have been given away by a stolid official regulation. Fancy the typical Customs officer left stranded in the Republic of Andorra! But that paragraph 19 shows an uncanny knowledge of aviators and their pleasant little ways.

20. No dutiable goods shall be removed in aircraft from the Isle of Man to Great Britain or Ireland except from an appointed aerodrome and with the consent of the proper officer of Customs and Excise.

This is really put in to convince aeronautical people of their astounding ignorance. Did *you* know that there were any goods which were dutiable as between Manxland and England, Ireland, Scotland, or Wales? Paragraph 20 might at least have satisfied our curiosity by specifying what goods are dutiable within what is erroneously called the United Kingdom.

21. If any aircraft arriving from a place outside the United Kingdom shall land in any place other than an appointed aerodrome, the pilot shall forthwith report to an officer of Customs and Excise or police constable, and shall, on demand, produce to such officer or police constable the log books belonging to the aircraft, and shall not allow any goods to be unloaded therefrom without the consent of an officer of Customs and Excise, and no passenger thereof shall leave the immediate vicinity without the consent of an officer of Customs and Excise or police constable. If such place of landing shall be an aerodrome the pilot shall forthwith report the arrival of the aircraft and the place whence it came to the proprietor of the aerodrome and the proprietor of the aerodrome shall forthwith report the arrival of aircraft to an officer of Customs and Excise, and shall not allow any goods to be unloaded therefrom or any passenger thereof to leave the aerodrome without the consent of such officer.

More trouble for the police. Imagine the local constable of, say, Pudcombe-Bagpuize surrounding the crowd emerging from a super-Handley Page and compelling them to "stay put" while he inspects the hieroglyphics in all the log-books of all the engines, and watches that no goods are removed, and sends for a Customs officer, and otherwise complies with the Regulations. This is adding an unfair burden to the peaceful existence of the rural police, and can only produce further unrest in the outlying branches of the Force.

22.—(1) The proprietor of any aerodrome shall at all times permit any officer of Customs and Excise to enter and inspect his aerodrome and all buildings and goods thereon.

(2) The pilot of any aircraft shall permit any officer of Customs and Excise at any time to board and inspect his aircraft and any goods laden thereon.

(3) The importer or exporter of any goods imported or exported in aircraft shall produce such goods to the proper officer of Customs and Excise at the aerodrome of importation or exportation, as the case may be, and permit him to inspect such goods.

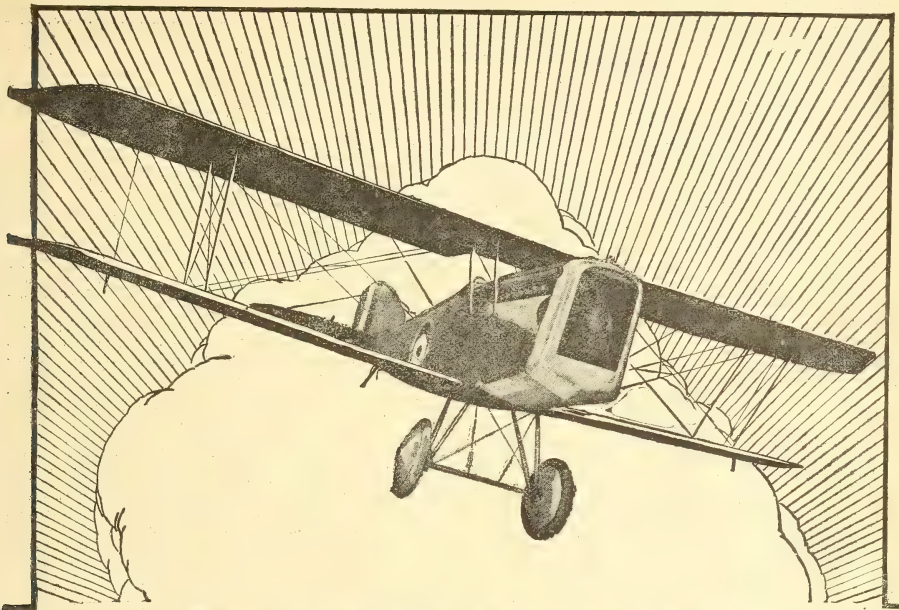
23. Any provisions for the time being in force of the Aliens Restriction Order or of the Defence of the Realm Regulations with respect to persons arriving in or departing from the United Kingdom by sea, shall apply to persons arriving or departing by air as if the same were herein set out, with such modifications as are necessary for adapting them to such purpose, and in particular with the substitution of appointed aerodrome for the approved ports specified in the Aliens Restriction Order.

24. All persons importing or exporting or concerned in importing or exporting goods, mails, or passengers, into or from the United Kingdom in aircraft and all pilots of aircraft arriving in or departing from the United Kingdom shall observe and comply with the provisions of sections 53, 76, 102, 104, and 118 of the Customs Consolidation Act 1876, as if any references in such provisions to ships or vessels and the masters or captains thereof, and to the loading or unloading of goods thereon or therefrom, included references to aircraft and the pilots thereof, and to the loading or unloading of goods thereon or therefrom, and as if references in such provisions to a quay included a reference to an examination station.

All of these are perfectly right and proper, especially paragraph 23, which applies the Aliens Restriction Order to passengers in aircraft. No rabid dog ever imported by air from France is half as dangerous as would be the rabid Bolshevist who might come by air, if and when our Government worked up sufficient courage to stop the breed from arriving by sea.

THE LAST OF THE DIRECTIONS.

We may now pass on to the last of the Directions. These do not apply to any of the Schedules, but to that paragraph 4, section (4) of the Regulations dealing with Government aerodromes which have been turned over



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for civilian flying. Here follows the text of the Directions :—

VI.—R.A.F. Aerodromes and Seaplane Stations.

1. With reference to Regulation 4 (4), the dues to be charged at R.A.F. aerodromes are as follows :—

A.—ACCOMMODATION.

The charge for accommodation will be based on the floor space occupied, i.e., the product of span and overall length. With folder aircraft the span to be taken as the overall width when folded. Charges will be as follows :—

	8 Hours or Less.	Up to 24 Hours.
	£ s. d.	£ s. d.
Small type, less than 900 sq. ft.	0 2 6	0 5 0
Medium type, not exceeding 1,800 sq. ft.	0 5 0	0 10 0
Large type, over 1,800 sq. ft.	1 0 0	1 0 0

MONTHLY RATES.—Accommodation for monthly periods will be at rates of £5, £10 and £20 respectively. Any accommodation so reserved, but not made use of, to be available for hire to other aircraft. No refund to be made to the monthly lessee, unless he is thereby prevented from obtaining accommodation, in which case a proportionate refund will be made as in the opinion of the Secretary of State appears reasonable.

B.—LANDING FEES.

These will be in respect of the cost of maintenance of the aerodromes, use of landing lights and beacons and supply of navigational information.

The charges will include ordinary attendance, e.g., guiding machines, starting propellers, re-fuelling, etc. (For pushing machines with stopped engines any considerable distance charges will be made in accordance with 3 (a) below.) At R.A.F. aerodromes where no attendance is available the charges will remain the same. The charges will be :—

	For Single Landing.	For books of 10 Coupons.
	£ s. d.	£ s. d.
Small type	0 2 6	1 0 0
Medium type	0 5 0	2 0 0
Large type	0 10 0	4 0 0

Each coupon to permit of one landing on any R.A.F. aerodrome for a period of 3 months from date of issue. Coupons to be transferable between aircraft, but not between owners.

No extra landing fee will be charged in respect of test flights before departure.

2. The R.A.F., its servants or agents, will not be liable for loss or damage by fire, flood, tempest, explosion, or other inevitable accident to aircraft or to the pilots, engineers, or other members of the crew thereof, or to any passengers, goods, or mails carried therein landing at or accommodated in any R.A.F. aerodrome.

3. (a) Attendance on civil aircraft by R.A.F. personnel other than the ordinary attendance included in the landing fees, will be charged for on the basis of labour and time. Such R.A.F. personnel will be available to assist civil aircraft only to a limited extent, and at certain aerodromes to be specified by the Secretary of State.

(b) Stores, such as fuel, oil, tyres, etc., and any standard spares that may be available, will be supplied to civil aircraft by the R.A.F. wherever possible, to meet emergency demands and when no other source of supply is available. Such supplies will be charged for, at the current retail prices.

(c) Repairs will be carried out by the R.A.F. for civil aircraft on emergency when no other arrangements can be made. Repairs will be confined to such work as will enable the aircraft to proceed by air within a short period. No repair which will exceed a cost of £10, exclusive of the cost of stores and spares supplied, will be undertaken before an estimate has been made and submitted to the owner of the aircraft.

Repairs carried out by the R.A.F. will be carried out to the satisfaction of the responsible inspecting officer, but no responsibility as to the airworthiness of the aircraft shall rest on the R.A.F. aerodrome staff.

(d) Where R.A.F. workshops are available but no R.A.F. personnel can be spared, arrangements will be made to permit the use of the workshops by civilian firms on appropriate terms.

(e) Subject to the exigiencies of the service, salvage of aircraft will be undertaken by the R.A.F. inside R.A.F. aerodromes, and as far as possible outside R.A.F. aerodromes. In both cases charges will be made accordingly to the cost involved.

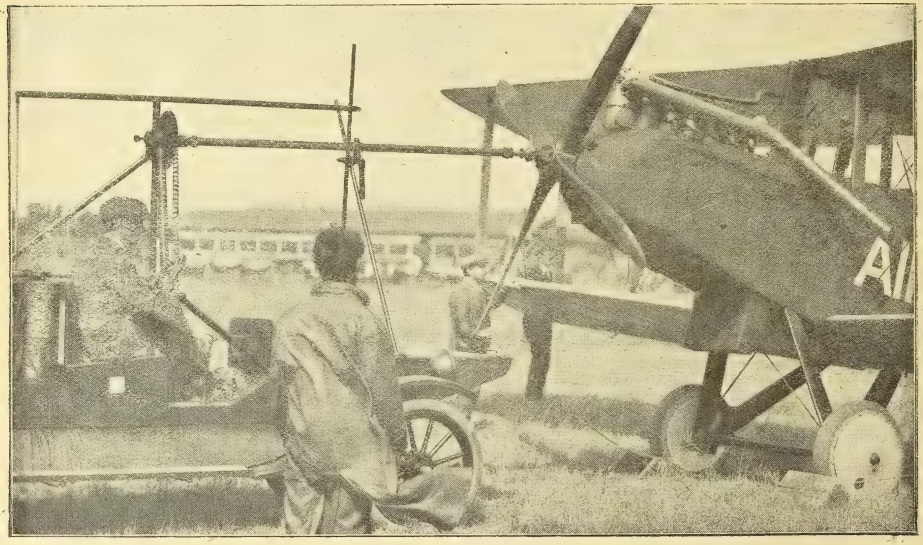
(f) Mechanical transport at R.A.F. aerodromes will be placed at the service of the civil firms on emergency, and when circumstances permit. The rates to be charged will be :—

	Per Mile. s. d.
5-ton lorry	1 9
3-ton lorry	1 6
30-cwt. lorry	1 3
Motor car	1 0
Motor cycle	0 4

These charges to include the driver; no vehicle being hired without an R.A.F. driver.

(g) Arrangements will be made for the use of telephone, telegraph, and Post Office facilities at R.A.F. aerodromes by civilian firms using the aerodromes.

4. Arrangements will be made for the use of aerodromes for purposes of tuition, exhibitions, or sporting contests. The charge



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will be in the form of a lump sum for the period for which the aerodrome is required.

The firm leasing an aerodrome for any such meeting shall be entitled to charge such entrance fees to spectators as they may desire. But they shall not charge more than the prescribed landing fees for any aircraft landing during the meeting. Such landing fee shall remain the property of the firm holding the meeting.

SEAPLANE STATIONS.

5. The arrangements and charges at R.A.F. seaplane stations will be, as far as practicable, similar to the above arrangements and charges at R.A.F. aerodromes.

VII.—Licensed Aerodromes.

1. The proprietors of licensed aerodromes will be regularly supplied through the Air Ministry with the latest approved meteorological information, and will be responsible for exhibiting the same in a conspicuous place, and for supplying the same to pilots requiring it.

2. Proprietors of licensed aerodromes should, as far as possible, keep records of wind and weather.

3. Adequate first-aid appliances must be kept at all licensed aerodromes.

WINSTON S. CHURCHILL,
Secretary of State for Air.

The first and obvious objection to these Directions is that they announce that the Air Ministry is setting up in trade. State trading is always bad business.

Nevertheless there is no help for it. The aerodromes are needed. They belong to the State. Aircraft owners cannot expect to have the use of them for nothing. So there is no way out of it except for the Air Ministry to set up as aero-garage proprietors.

One can only hope that these State aerodromes will be properly run and that the right people will be put in charge of them. The Air Ministry cannot be expected to find a Lindsay Lloyd or a Richard T. Gates or a Bernard Isaac to run each and every aerodrome, but it is to be hoped that capable and experienced business men will be appointed as managers and not young and swelled-headed R.A.F. officers, nor dug-out case-hardened sailors or soldiers who have gravitated down to the R.A.F. because their own services do not want them. There are, in fact, plenty of excellent men in the R.A.F. itself if the Controller-General of Civil Aviation will devote the necessary time and trouble to discovering them.

The garage fees do not strike one as being excessive, but they might well be reduced, and one fails to see why the landing fee for a small machine should be as high as the price for garage for 8 hours. A shilling should be quite enough for a mere landing, if the machine is left out on the ground and is not pushed into a shed.

If it is pushed into a shed, then 2s. 6d. is moderate enough. But when once it is there it costs nothing to the State, so the 2s. 6d. ought to cover it for the whole 24 hours.

Though it is not specified, one assumes that "joy-rides" given to the pilot's friends after landing are reckoned as "test flights before departure," and so do not involve any further landing fees. But it would be well to have an official dictum on this.

LANDING HABITS.

The idea of charging extra for pushing machines long distances is excellent. This will teach haphazard pilots not to go and stop their engines away out at the other side of the aerodrome, and will save the mechanics much sweat and swearing. From what one has seen of late, some of our war pilots really do need to learn a great deal about aerodrome flying, and this is one thing that will help.

But who is to judge what is "any considerable distance?" Recollect that side-slip landings and such "stunts" are forbidden, and that machines must alight in the proper direction in the prescribed "landing zone." That may take them a more considerable distance from the sheds than if they were allowed to do an Immelmann turn and a side-slip in over the sheds. These things must all be taken into consideration.

IN FINE.

Taking them all round, the Directions seem sufficiently reasonable in principle. The charges, on the whole, are less than those which would be made by ordinary aerodrome or garage proprietors. It only remains to be seen whether the principles are properly handled in practice. And that depends entirely on the selection of the men who are placed in command of these civil aerodromes. It may take some time to find the right men, but it is not difficult to do so, and one wishes General Sykes success in his task.—C. G. G.

MORE AIR MINISTRY METHODS.

The following letter indicates another of the Air Ministry's queer methods of assisting Civil Aviation:—

Sir,—Re Ground Engineers' Certificates.

Having forwarded a letter, copy of which please find enclosed, requesting an explanation as regards my examination for the above certificate, and up to time of writing not having received a reply, perhaps you will be good enough to find room in your columns for my experiences when applying for same.

I applied for a licence for all types of machines and engines. When being examined, I was faced by seven officials who gave me an oral exam.: but first informed me that I could only be examined in specified machines. Why?

Mentioning one or two types of machines and engines, I was examined in D.H.9s, and Clergêt and B.H.P. engines. The questions, in my opinion, on rigging and construction, were very fair, but although a number of questions were asked as regards carburation, ignition, etc., a great number seemed directed to finding out whether examinees had Pelmanised engine clearances as specified by the makers, and not as to how to take up play on big ends, bedding a crankshait, and similar practical questions.

Two of the four candidates were recalled whilst I was there, and were informed that they had failed. An official came out to me, and informed me that I need not wait, as I should hear from London.

On the 6th inst., I received a licence which entitles me to check the rigging, and periodically overhaul Avros and Airco machines (How do the Air Ministry define an overhaul?), although no mention of the former machine was made, except that I stated that I had been inspecting for that company. But not a word about engines or an enclosure to say that I had passed or failed, only the usual request to return the enclosed receipt.

As you will note, I am a qualified inspector of Avros, although I have not been examined for that type of machine. It so happens that I have had considerable experience of the Avro machine, what will be the result if the Ministry issue certificates in a similar manner to persons who have not had the necessary experience?

Are not candidates entitled to know that the members of the Board who are examining them are fully qualified to do so? I believe in many instances the candidate would be found to have had far more experience than the examiners

Personally, I have been responsible for the inspecting and submitting to A.I.D. of 450 D.H.9 machines, and I am wondering what experience the pilot who examined me on rigging, etc., had had of that machine, especially as my experience of pilots who have applied for positions as inspectors under me is, that although they may be remarkably good airmen, their knowledge of rigging and general aircraft construction is nil.

June 9. (Signed) "INSPECTOR."

THE RE-ORGANISATION OF THE R.A.F.

The following letter has been received:—

Sir,—You invite criticism of the proposals outlined by Major-General Sir Hugh Trenchard, K.C.B., D.S.O., in his speech of the 14th inst.

The following questions occur to me:—

1. Why should officers be invited to take temporary commissions and so enter a "blind alley" occupation?

2. Why should officers if they are proved fighting pilots and otherwise qualified as to age and education be chucked out of the Service to make room for officers trained in a "R.A.F. Sandhurst?" (whatever that training may be, I fail to see how it can compare with the training of actual warfare).

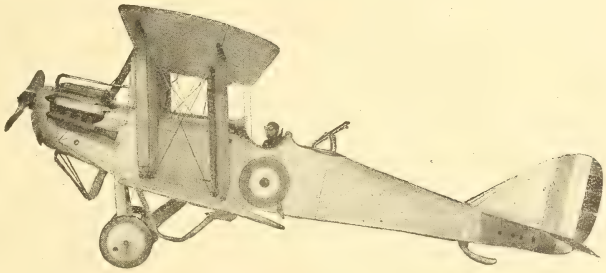
The Territorial Air Force is a sound idea, and if it could be run entirely with its own, or Navy, or Army, organisation would attract the best of the proved fighting and civilian pilots, and, I think, in case of need, would prove at least as efficient as the new R.A.F. outlined in the speech. "AUDAX."

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The WORLD of AERONAUTICS

NEWS OF THE WEEK FROM ALL QUARTERS

Inverted Aviators.

Major-General the Right Hon. J. E. B. Seely, C.B., C.M.G., D.S.O., M.P., told the British Science Guild the other day that aviators had told him that when they were flying upside down in fog or cloud "they had not felt any rush of blood to the head, and the only thing that suggested to them that they were flying upside down was the knocking of their cigarettes against their noses."

Of course, another method of proving whether one is upside down or not is to undo one's safety belt.

The remark also recalls the story of the boy who asked why the blood rushed to his head when he stood on it but did not rush to his feet when he stood upright. He was told it was because his feet were not empty.

"Name—Address—Description."

A correspondent writes to the "Times":—

In the parish register of Whittington, Salop, is an entry of a marriage, under date Sept. 11th, 1837, in which the "condition" of the parties is recorded thus:—"The man fat," "The woman rather lean."

A letter was published in the "Times" of Monday pointing out that in legal documents "description" is often taken too literally.

This reminds one that during the war the numerous forms that had to be filled up were a source of innocent merriment to many. One remembers the following dialogue between a worried officer and a dazed airman:—

"What's your name?"

"Jones, Sir."

"What initials?"

"Church of England, Sir."

Side-Step Landings.

Describing the Aerial Derby, an evening newspaper stated that "Colonel Henderson was another who was up and did some beautiful side-step landings."

The ability to side-step is very useful when a pilot is visiting a civil aerodrome and has landed in the taking-off zone owing to the confusion caused by contradictory regulations.

It now remains for the "Daily Mail" to continue its aerial activities by offering a prize of a golden slipper for the side-stepping aeroplane with the smallest feet.

Those D—— Dots Again.

The "Daily Chronicle," evidently feeling that the successful trans-Atlantic flight has united the two nations, has begun to study the American language. Observe:—

'Captain Alcock's achievement has set optimists talking of the near future, when aircraft will 'compete commercially with the fastest liners and cable companies.'

"Well, the liners are beaten to a frazzle already, but the cable companies are not likely to worry yet awhile. The time taken for a signal to travel the Atlantic cable from Valentia to Nova Scotia—2,690 miles—is 0.28 sec., and the aeroplane that beats that will have to hurtle along at something like a quarter of a million miles an hour!"

The attempt to write American is better than the arithmetic. The M.P.H. would be over thirty-four and a half millions, which is something very unlike a quarter of a million miles an hour.

One feels that the writer would be a worthy successor to the famous Statesman who explained that he "never did understand what those damned dots meant."

Sympathy.

The U.S.A. War Department reports that "Col. Archie Miller, from an airplane, dropped the ball for the Yale-Princeton Game, Saturday."

A sympathetic member of the W.R.A.F., who read the announcement, was heard to remark, "Hard luck."

Another Ruthless Rhyme.

Felix, of the Zeppelin huns,
Watching anti-aircraft guns,
Laughed and laughed, and laughed and laughed,
Till he fell out, and thus was strafed.

* * *

A p'liceman and a copper's nark
Found him in St. James' Park.

The Faithful Camera.

On June 20th, the "Daily Mirror" published a photograph with this inscription:—"The R.34, provisioned for several days, starting off for Heligoland and Kiel Canal."

In large letters and figures one sees R.33 painted fore and aft on the airship which is depicted. "Ah, well! these little mistakes will happen," as the bank clerk explained to the manager, who complained that he had added the date to the amount standing to a customer's credit.

Unexciting Inactivity.

According to the Air Service News Letter from Washington:—

Lieutenant William McBreck, R.M.A., A.S.A., accompanied by representative of Pathé News Service, flew over Mount Lassen an inactive volcano taking moving pictures."

But can a volcano that is taking moving pictures be called inactive?

If the writer means that the Pathé representative, and not Mount Lassen, was taking the kinema photographs, then one wonders who would pay to see moving pictures of an inactive volcano. It would be even less exciting than a film showing a slumbering Boloafer taking the necessary inaction in the Bolo.

It Merits Punishment.

It is announced that:—

"Captain Louis E. Appleby, commanding the fliers covering Arizona on general recruiting, carried in his airplane from the people of the Imperial Valley, California, to the Governor of Arizona, a crate of cantaloupes—distance 260 miles, time 200 minutes."

A flippant Pressman remarked that judging by the speed Captain Appleby can't-a-looped on the way.

The Aeroplane Linen Deal.

The daily newspapers have indulged in somewhat ill-considered criticism of the sale of forty millions of yards of aeroplane linen to Mr. Leonard J. Martin for the sum of £4,000,000. It is said that by this deal Mr. Martin has "cornered" the market.

The "Morning Post" of June 20th remarked:—

". . . . In 1915 the whole produce of the Irish factories was commandeered. The demand grew enormously as aircraft production expanded, and millions of yards were called for, practically unlimited orders going to Ireland, all weaving for other purposes being stopped. The result is that outside of Great Britain there is practically no linen cloth at all. France and Italy are clamouring for it, and Germany presents a vast market. She has no linen.

"Last year the Government took the further step of buying up, for £12,000,000, the whole Irish crop of flax, the acreage of which had been greatly extended, as no flax was coming from Russia. This price worked out at about £40 per acre, whereas the normal figure was £2 10s. The British Government, in fact, had a monopoly of the world's flax, for Russia, having gone Bolshevist, did not count. They also spent over £1,500,000 on trying to cultivate flax in Yorkshire, but the experiment was not a success.

"Mr. Martin is now in possession of the whole woven output of the Irish mills and stuffs produced elsewhere. It was made to certain specifications, and is probably the strongest fabric made, capable, as one of the leading manufacturers told a representative of the 'Morning Post,' if taken from the loom and used as a cable, of holding a battleship. It is unbleached, but can be used for ladies' dresses, sheets, table linen, underclothes, and is more enduring than cotton.

"In an announcement in these columns this year the Government said it had great quantities of linen on sale, but limited the unit to 1,500 yards, at 7s. per yard. Mr. Martin has been enabled to buy 40 million yards for £4,000,000—2s. a yard. If he sold to-day at 3s. a yard he makes a gross profit of £2,000,000. What the cloth has cost the Government is not known. A Belfast manufacturer put it at nearly 4s. per yard at the very lowest, because all prices were enhanced, the women and children who gathered the crop last year getting over £1 per day. Formerly they were paid 15s. per week. The difference between 2s. a yard and 7s. a yard is £10,000,000.

Belfast will be seriously affected by this deal. Till Mr. Martin has disposed of it they will probably have to shut down their mills. He makes no disguise of the fact that he can undersell

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1. The Pilot of the English machine which has now crossed the Atlantic, thereby winning the "Daily Mail" prize of £10,000, stated "that he thought the flight should be done not with an Aeroplane or Seaplane, but with a FLYING BOAT," vide "Daily Mail," 16th June, 1919.

2. Messrs. Hawker & Grieve in an efficient Land Machine failed only because of a choked filter. Had a FLYING BOAT been used it would have been possible to alight on the water in order to rectify the trouble.

3. The first machine to cross the Atlantic was a FLYING BOAT N.C.4. Another FLYING BOAT of this type was forced to alight on water, but succeeded in reaching port 200 miles away under its own power.

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them in any market. It will also prove disastrous to the cotton trade, for the finer counts cannot be sold owing to the present price of cotton.

"The situation caused the utmost consternation yesterday among all engaged in what the Americans call "the dry goods trade."

Other journals publish letters from correspondents who, in language of varied temperatures, demand to know why the Government have not sold the linen directly to the public, as a monopolist's profits might then have been saved and the country might have obtained from its property a sum approaching that at which it was purchased.

The demand seems reasonable until one reflects upon all that might have happened if the Disposal Board had decided to peddle 40,000,000 yards of linen. Having some knowledge of departmental methods, one thinks that the first step would probably have been to commandeer another London hotel in the most fashionable and expensive quarter that has not yet been Governmentalised. Then there would have been carried out a recruiting campaign with the aid of expensive highly-coloured posters, to inform linen drapers' assistants that their King and country needed them. Those assistants would have to be fitted out with specially-designed uniforms and drilled. Officers would then be appointed by the Air Ministry from the mass of those who are not sufficiently acquainted with any branch of human knowledge to be able to earn a living in any civil capacity, and an establishment would be drawn up to provide some chances of promotion, such as appointments as Controller-General of Surplus Textiles, Deputy Assistant Controller-General of Lingerie Department, Technical Adviser in Chief to Controller-General of Surplus Textiles, Juvenile Underclothing Department, and so on.

By the time the fashionable hotel had been converted into a departmental store and all the officials had been gazetted it is probable that two years would have elapsed, and by this time the Special Legion of Royal Linen Drapers and Haberdashers would have grown into a vast organisation and have been reviewed complete with bands in Hyde Park, loudly cheered by the taxpayers.

Officers in brass hats would have been sent for special courses of instruction at Oxford to learn the art of shopwalking from experts enlisted from Peter Robinson's, and who had been given rank of acting colonels for the purpose.

What fun we might have had! On the whole one is inclined to think that the Bolo has missed a great opportunity, but that the country is probably quite a lot in pocket by this deal.

And, anyhow, it gets £4,000,000 for the linen, whereas if it had sold the stuff itself, the whole of the value, and a bit over, would have been dissipated in selling expenses.

An American Invention.

According to the "Telegraaf," of Amsterdam, a large flying-boat is in the course of construction in America which will be driven by two steam turbines together developing 1,200 h.p.

The R.A.F. Club.

At the anniversary dinner of the Lyceum Club, Piccadilly, on June 23rd, Lady Strachey, the president, announced with regret that that would be the last Monday dinner of the club, because the premises had to be vacated shortly in order that the Air Force might take possession.

Flying to India.

According to a message dated June 21st, a squadron of British aeroplanes left Athens recently for India, *via* Crete and Egypt.

Folkestone to Cologne Air Mail.

The daily aerial service between Hawkinge and Cologne has increased very much. The service was instituted on March 1st with four aeroplanes and carried 25 bags of mails. Since then the mail has increased to a total of 2,276 outward and 886 inward bags for the three months ending May 31st.

Correspondence leaving Cologne one morning has been delivered to all parts of England and Wales by the first post on the following morning.

Flying Fatalities in Peace-Time.

Records of flying fatalities at U.S. flying fields show an increase in the fatality rate in recent months as compared with the average rate up to the Armistice. From June 1st, 1918, to the Armistice the average hours flown per fatality was 3,149; from the Armistice to date the average is only 1,852 hours per fatality, or an increase in the rate of 41 per cent.

The following table shows the pre-Armistice rate compared with monthly rates since the Armistice:—

Period	Fatalities.	Hours flown.	Hours flown per fatality.
June 1st to Nov. 11th, 1918.....	156	491,283	3,149
Nov. 11th to Jan., 1919	42	78,831	1,877
January	6	16,408	2,750
February	17	15,688	922
March	14	28,672	2,005
April	6	14,650	2,441

The Dutch Aircraft Exhibition.

It is now stated that the Vickers "Vimy" biplane (Rolls-Royce engines), which crossed the Atlantic on June 14th, will be exhibited at the Dutch Aircraft Exhibition at Amsterdam this August. Capt. Sir John Alcock, K.B.E., D.S.C., R.A.F., is expected to pilot the machine.

The "Daily Telegraph" correspondent states that this show is to be kept entirely for the British and Allied Aircraft Industries, but adds that at present the French are better represented than the British.

Among the British firms exhibiting are Handley Page, Ltd., the Aircraft Manufacturing Co., Ltd., the British Aerial Transport Co., Ltd., the Blackburn Aeroplane and Motor Co., Ltd., and the British and Colonial Aeroplane Co., Ltd.

The Territorial Air Force.

General Sir Hugh Trenchard opened on June 20th the first aircraft instructional wing in connection with the Territorial Air Force movement at 25, Camden Road, St. Pancras. He emphasised the importance of the formation of such wings, and said that those working with him at the Air Ministry were devoting great attention to the development of aircraft in the Territorial Force.

This instructional wing is affiliated to the 19th County of London Battalion of the London Regiment, and its object is to instruct boys between the ages of fourteen and seventeen in aeronautics. Some forty boys have been accepted as cadets, and wear khaki uniform with the old R.F.C. cap, which are lent to them on payment of the entrance fee of 2s. 6d. and can be bought for 28s.

The Air Ministry has supplied a number of engine and aeroplane parts with many diagrame, and also they have obtained three aeroplanes and a new 110 h.p. Le Rhône engine.

The O.C. is Major Moore, of the Territorial Force Association, and he is assisted by a few officers and ex-officers of the R.A.F., who voluntarily lecture and instruct the cadets, together with a technical sergeant-major who is stationed at the depot.

Classes are held on Tuesday and Thursday evenings from 7.30 to 9.30, lectures on engines and rigging being alternate. Unfortunately, only half the cadets take advantage of these classes, but they are all very keen on the trips to aerodromes and aeroplane works.

There is accommodation for another twenty or thirty good class cadets at the Camden Road depot, but boys are wanted who are really keen on aeronautical engineering; and ex-officers of the R.A.F. are also urgently required for instructors.

Several other instructional wings are shortly to be opened, affiliated to other battalions of the London Regiment in other parts of London, and there is no doubt that as soon as they become known of a great many boys will take advantage of the training.

These instructional wings are excellent for teaching boys to become aeroplane mechanics, or perhaps even aeronautical engineers, but they do not help to form a Territorial R.A.F. of ex-flying officers and cadets which is so urgently required to be formed before all the demobilised pilots lose their keenness to fly and get swallowed up in civil life.

The statement at the beginning of this article that "the Air Ministry were devoting great attention to the development of aircraft in the Territorial Force" might mean many things, but one hopes it indicates the start of a real Territorial R.A.F., about which one may be able to write more next week.—G. L. DORE.

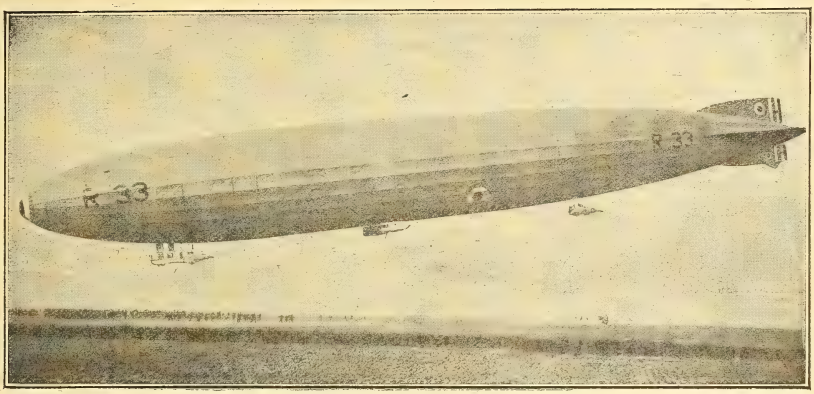
The Accident Near Sleaford.

At Lincoln Assizes on June 20th, before Mr. Justice Shearman, Flight Cadet Trevor Walter Chater, R.A.F., aged nineteen, was acquitted on the charge of the manslaughter of Captain Robt. Garspar Dunn and Lieut. William John Pegg, two convalescent officers, who were driving to a hunt meeting at North Ranceby, when an aeroplane swooped down on them and killed them.

Edward Labraham, stud groom at Caythorpe Court, who was driving the trap, said that he saw the aeroplane following them on the road. It dived, and then for a time disappeared over the Cranwell Aerodrome. When he saw it again the aeroplane was right on top of them. It hit him on the head, and he became unconscious. When he recovered he was still in the trap and the two officers were in their places—dead.

The defendant said that he was the pilot. He saw the trap on the road, and went over the aerodrome to give it an opportunity of going forward. He was practising diving, and travelling 90 miles an hour. There was a haystack fifteen yards from the road, and that was his diving objective. He turned and dived for the stack. At that time he saw nothing on the road, but felt a bump. At first he took it for an air bump, but on reflection thought the pressure he felt was too great for that. He turned and searched along and around the road, but saw no trace of the horse and trap. He was informed of what had happened later.

The defence set up was that there was no such culpable negligence as would justify a verdict of manslaughter. A breach of discipline in flying low over the road was not sufficient to establish manslaughter.



R33 and R34 are each equipped with five

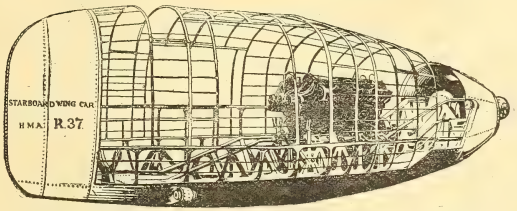
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The WORLD of AERONAUTICS (continued)

Hawking German Aeroplanes.

It was announced on June 20th that arrangements had been made with the Air Ministry to supply six captured German aeroplanes for Trafalgar Square. These will be placed on the square on June 26th, 27th, and 28th, and will be dismantled and given away in parts to those who purchase Victory Loan or War Savings Certificates.

One believes that the scheme is likely to benefit the Loan much as one dislikes the idea of the Government hawking fragments of these aeroplanes for the sake of pandering to somewhat morbid tastes.

Aviation and India.

On June 5th, Brig.-General the Lord Montagu of Beaulieu read before the Indian Section of the Royal Society of Arts a highly interesting paper on aviation as affecting India.

Unfortunately the pressure of current events has prevented the publication of that paper hitherto, and the paper itself is of such importance as to make it impossible to publish a brief résumé of it. Therefore one hopes at an early date to publish the bulk of the paper and all the comments thereon.

General Ashmore and the L.A.D.A.

Major-General E. B. Ashmore, C.B., C.M.G., M.V.O., R.A., unveiled a memorial at Poplar on June 23rd to the 18 children who were killed in their class-room at the Upper North Street London County Council School on Wednesday, June 13th, 1917, by the explosion of a bomb dropped by enemy aircraft.

Speaking as the officer to whom was entrusted the duty of organising London's air defences, General Ashmore said that the authorities did not know at the time how decisive was their victory. Personally, he felt at the time of the last raid that the enemy would not try to get to London again, although he did not like to prophesy, for that was a very dangerous thing to do. Between that day and the signing of the armistice he had perfected a new system of defences, and when November 11th, 1918, came the defences of London were at least four times as strong as they were on the preceding May 19th.

Up to the raid which killed the children at Poplar, the enemy had come in the daytime with impunity. The bomb which killed the children weighed 100 lb. In a way the school was lucky, for the bomb broke in two in going through the floors, and only one part of it exploded. It was after this that the L.A.D.A. were started, and during the time they were in progress there were two more day raids made with a view to reaching London. One was stopped at Southend and the other at Ramsgate, and at the latter place the guns shot down two of the raiders.

So far as the night raids were concerned, he himself at one time looked as though he would be hanged, but the Government spared nothing in the way of guns and searchlights. London, however, owed its defence more particularly to the gallant boys who flew by night, and so splendidly did they do their work that two squadrons were made up to do night fighting work over the lines in France.

The balloon aprons which were erected in certain localities were also found very serviceable. Accordingly, on May 19th, 1918, when seven machines were brought down, this finally decided the Huns and they left London alone and turned their attention to Paris, which they afterwards raided sixteen times.

PARIS NOTES

Height Records.

Lieut. Casale is a most persevering aviator. On June 14th he set out for the third time in the short space of two weeks to beat the height record. Each time he has beaten it, and in so doing has had the satisfaction of beating his own. His present (and the world's) height record is 10,100 metres (32,825 ft.)—what memories does it conjure up of Paulhan's first attempt on a height record, when, at Brooklands he attained the dizzy height of 970 ft.! Thus one has no hesitation in affirming that he has been higher than living man, unless, perchance, the few balloons and dirigibles that have "escaped" have carried their unwilling occupants higher; but then they have never returned to say.

He left Issy-les-Moulineaux at 9 a.m., and landed at Villacoublay one hour and fifty-five minutes later. The lowest temperature recorded during the flight was 50 deg. Cent. (80 deg. Fahr. of frost). As in his previous attempts, he flew a 300 h.p. Hispano-engined Nieuport with a Lumière propeller.

Urged no doubt by the claim made by Miss Ruth Law of having flown at a greater height than her recent record, as far back as 1917, Mme. de la Roche decided to make an attempt and to beat her own record. With this object in view, the aviatrice left Issy-les-Moulineaux on the 12th inst. at 7.8 p.m. on her tiny G3 Caudron. Climbing with remarkable regularity, she reached rapidly a height of 4,800 metres (approximately the height of Mont Blanc). At this altitude she encountered fog, and as the night was approaching she was obliged to land at 9.15, at Gastins, 8 kiloms. from Nangis, in a clover field. The landing was without incident. The following day she returned to Issy, accomplishing the 70 kilometres in 1 hr. 40 min. The attempt was witnessed on behalf of the Aero Club, by Capt. Madon, Adjudant Chainat, and Sgt. Jalaquier.

Two Competitions Deferred.

The competition that was to have been organised by the "Echo de Paris" with prizes of 300,000 francs has been postponed till 1920 for various reasons, chief among them being the wish to give constructors sufficient time to design and construct machines specially suitable to the conditions of the competition.

The Aerial Circuit of the Battlefields has also been postponed, though for different reasons, chief among these being the difficulty, nay, impossibility, of preparing sufficient landing grounds in the middle of the devastated areas

[The devastated areas are full of the best aerodromes in France, built by the Germans regardless of (French) cost. Probably the real reason is the impossibility of getting a "gate" in the devastated areas.—Ed.]

The cross-country contest organised by "L'Avenir" with 100,000 francs in prizes will be held as originally arranged.

Voisin Works Ablaze.

Part of the Voisin Works and hangars at Issy-les-Moulineaux were burnt out this last week. Most of the buildings affected were of wooden construction, so that the fire spread rapidly, and it was only after great efforts that the Caudron Factory was isolated. Another achievement of the scratch fire brigade was the isolation of the petrol store. The saddest part of this conflagration is the fact that Mr. Gabriel Voisin's laboratory particularly suffered, and that many dossiers of his plans and inventions, some not yet public, were completely destroyed.

Coming Events.

The French aeronautical authorities have recently communicated to the Press a note of the great flight which is in course of preparation, under official patronage, and also a list of the pilots chosen to accomplish them; even the makes of machines and motors have been published as chosen. The routes are:—Paris-Constantinople, Paris-Madrid, Paris-Prague-Warsaw-Vienna, Paris-Brussels-Amsterdam, Paris-Cairo *via* Constantinople, Paris-Tunis and return, and Paris-Dakar. The fortunate pilots selected are:—Commandant Vuillemin, Capt. Fonck, Lieut. Marinovitch, Lieut. Flacnaire, Lieut. de Romanet, and Lieut. Lemaitre, and the machines and engines adopted are:—Nieuport, single-seater, 300 h.p. (235 k.p.h.); S.E.A. fighting two-seater, 400 h.p. (210 k.p.h.); Spad, single-seater 300 h.p.(231 k.p.h.). Caudron, twin motor (touring type); Farman twin motors (touring type); Bréguet, two-seater, 400 h.p.

Under the direction of Squadron Commander Poli-Marchetti all this organisation is grouped, the main idea apparently being economical utilisation of effort and material.

There is likely to be considerable criticism of this plan, because it deprives the industry of the necessary stimulus for making these intercapital flights itself, and because it savours too much of a prejudiced selection of machines and pilots, particularly the latter, as there are so many thousands from whom to choose. No doubt, when the authorities fixed on the scheme and promised it their official support, they were mainly concerned with satisfying themselves that these flights would be accomplished by the best pilots and best machines, helped by the best State organisation, in order that the best effect possible should be produced in the foreign and adjacent markets. One of the most puissant arguments against this method of State fostering is that the official list of pilots does not contain either Roget, Fontan, or Lemaitre!

The Air Code.

The Aeronautical Commission of the Peace Conference has finished the draft of the Air Code. This convention, which will regulate and control future international aerial navigation, was agreed to unanimously, and has been signed by the different Allied States, and now only awaits its final ratification.

Captain Ropert, secretary to the Commission, recently went to Brussels and London by aeroplane, in order to get the code signed by statesmen who were unable to sign it in Paris.

The New Aerogiirs' Trial Flight.

The new model of the aeroplane fitted for surgical work made its trial flight near Paris this week, taking on board Dr. Tuffier, member of the French Academy of Medicine, and Dr. Foveau de Courmelles. On landing, they expressed themselves well satisfied with M. Neminowski's arrangement.

A New Aviation Journal.

Another aviation paper, called "L'Air," has made its appearance as a monthly illustrated. It has passed through all the difficulties, and has all the defects of a first number, but is brightly written for the lay public. One hopes it will have greater success than "La Poste Aerienne," which made its first and last appearance three months ago.—F. T. N.

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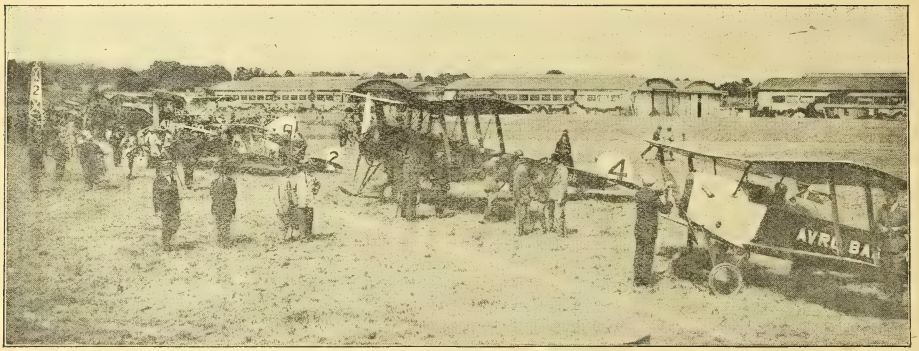
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THE AERIAL DERBY.



THE START FOR THE AERIAL DERBY.—As seen from the Enclosure.

The London Aerodrome at Hendon bore quite a remarkable likeness to its pre-war self when the Aerial Derby was flown on June 21st. There was quite a good crowd, albeit the enclosures only covered about half the area available before the war. There were many fine cars present. And there were some quite good people among the crowd, though it is evident that even the advertisement given to flying during the war has not convinced either the newspapers or the better classes of Society that aeroplane racing is as important as horse-racing to the future of this country.

One is as yet unable to lay hold upon the precise psychological cause which makes a second-rate horse-race a "function" while a first-class air-race remains only a "show." Perhaps it is that the newspapers overdo the advertising of aviation instead of accepting it as an ordinary fact of daily existence, and so set against it the better-class people who object to having things rammed down their necks by ignorant journalists. If the papers merely reported aviation events day by day as they report horse-racing and cricket and boxing and so forth, perhaps flying might soon be accepted as a national sport instead of merely as a newspaper stunt. On which point one recommends a study of "Medway's" article under the "Commercial Aeronautics" heading this week.

However, to return to the Aerial Derby. The accommodation for visitors at the aerodrome has been improved since Whitsun. The private boxes, called cattle-pens by the irreverent, are a good idea, in that they provide a certain amount of privacy from the crowd for the elect who can afford to indulge in luxuries, and should also provide useful protection for the crowd if a machine should suddenly go mad and bite and decide to charge the railings. It is obviously better that an aeroplane running *amok* should wipe out a few sparsely inhabited private enclosures than that it should hew its way through a closely packed crowd.

The catering arrangements will doubtless be got right in time, but some early visitors were rather annoyed to see a dozen or more waitresses hanging around doing nothing while people were sitting waiting to get some lunch before the race began. One recommends this department generally to the attention of the aerodrome management.

Thanks to the efforts of Mr. Bernard Isaac, who generously gave his services and his vast experience to organising the race, probably out of sheer devotion to the sport of aviation, and owing to a desire that the first post-bellum Aerial Derby should not disgrace those with which he had been concerned before the war, the actual arrangements for the race were very well made. Still, one man cannot do everything, and he must rely on the intelligence of those who have to carry out his instructions, and so, human intelligence being what it is, those who complained about minor defects in the organisation should blame those who had to operate the plans rather than the man who made them. For example, it was presumably not part of the original plan that the machines on the starting line should be pulled and pushed into new positions over and over again during the hour or so before the start.

The race itself was, on the whole, quite a satisfactory effort, despite the best efforts of the Air Ministry to ruin it. The best speeds were at any rate 20 miles an hour below what they would have been if the Air Ministry had not tried to spoil sport, but they were high enough to give the public a very fair idea of pace.

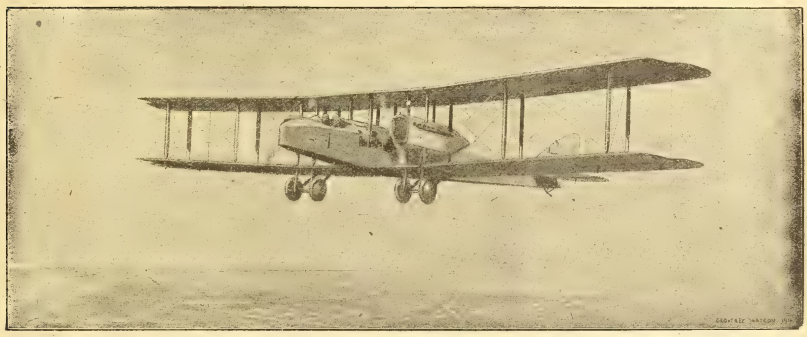
The winner's machine, an Airco D.H.4 with a 450 h.p. Napier Lion engine, had been speeded up by the simple process of cutting off the lower plane for a complete bay on each side, thus giving a vast overhang to the upper plane. This meant less surface, and so heavier loading per square foot, and less head-resistance. The result was a machine which flew faster, but seemed to be dragged through the air rather than to float, as is the manner of other D.Hs. Nevertheless it was a fine speed machine, and Captain Gathergood flew an excellent course.

The finish of the race was entirely spoiled by a Kangaroo and a Grahame-White Avro, the former with a parachute *artiste*, which played around and distracted attention just when the most tense interest should have been aroused by the arrival of the winner. The aerodrome official who let this raree show occur at precisely the wrong moment should evidently be prevented from interfering in future serious flying.

The second machine in the Handicap, which was also the third in the scratch race (or Derby), the 170 h.p. A.B.C.-Bantam-



THE PRIZE WINNERS.—Left to Right: Capt. Gathergood (First in the Derby); Capt. Hamersley (First in the Handicap and Last in the Derby); Lieut. Nisbet (Second in the Derby and Third in the Handicap); Major Draper (Second in the Handicap and Fourth in the Derby); Mr. Marcus Manton (Third in the Derby and Fourth in the Handicap).



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Bat flown by Major Chris. Draper, had likewise had its lower plane abbreviated right up to the undercarriage struts. Its terrific speed for its size made a very great impression. The long upper plane, the white body with its black cowl, and the generally slender and minute appearance of the machine, inspired a humorist to call it "the Skinned Bat," and as such it is likely to be known in future. Major Draper, who has an excellent war record, showed that he has the makings of a first-class competition flier, as well as being a wonderful demonstration pilot. He never gave away an inch at the corners of the aerodrome, nor—one is told—at the turning points along the course. One expects big performances from him in the classic air races of the future.

Lieutenant Nisbet's Martinsyde, which has the beautiful lines which one associates with all Martinsyde design, had rather hard luck in losing the Derby, for one believes that it was a shade faster than the Airco-Lion of Captain Gathergood. Mr. Nisbet obviously flew a very good course across country, but he flew wide on the turns, and may have lost himself the race in consequence. He also will do well in future races. After all the good work Messrs. Martin and Handasyde have done since the earliest days of flying, everybody would be glad to see them pull off a big event, and one wishes them luck in future.

Though the crowd had gone before he finished, those on the inside of things and those who were sufficiently interested to stay to the end gave Captain Hamersley a fine reception when he finished on the little 35 h.p. Green-Avro. Considering that Captain Hamersley had flown the machine from Southampton in the morning, he put up a very plucky performance, and he thoroughly deserved his win in the Sealed Handicap.

He went up again a few minutes after he had finished and gave a display of fancy flying which quite fascinated the on-lookers. He is certainly one of the neatest pilots in this country to-day. The little Green engine—which, incidentally, is nine years old, and is the identical engine with which Colonel Beatty, Captain Pixton, and several other famous aviators took their certificates on the original Avro biplane in 1910 and 1911—ran like a sewing-machine, and the machine's neat lines and obviously easy flying quite took the fancy of everybody who knows anything of aviation, and of a great many who do not. If the engine can be produced at a reasonable price, here is evidently the prototype of the light sporting machine of the future.

It is another proof of the fact that if a thing *is* right it *looks* right. Also it proves once more that the man who has a natural eye for design, and who has learned the art of construction in the school of experience, can more than hold his own with the designer who has merely swallowed an N.P.L. Blue-Book and suffers from mental indigestion in consequence.

The fastest machine in the race was the Jazz-painted Nieuport Nighthawk piloted by Lieut. Tait-Cox. The builders had somehow managed to get hold of an A.B.C. Dragonfly engine in spite of the Air Ministry. It put in a fearsomely fast first lap, but apparently the engine expired about half-way round the second lap. Another Nighthawk, very skilfully piloted by Mr. James, gave a very impressive show of trick-flying during the afternoon, and made one regret all the more that its stable-companion failed to finish.

Mr. Clifford Prodger, who flew a standard Bantam Bat with a Wasp A.B.C., was stopped at Fairlop by broken tappet-rods. This was particularly hard luck, as he had refused a mount on other machines in order to fly the Bat which he admires so much. One gathers from him that his engine failure has in no way affected his high opinion of the Bat machine.

The big Commercial Bat was unfortunately put out of action in the morning before the race by Mr. Cyril Turner, who apparently tried to land too slowly after his first trip on the machine, and buckled a tube in the landing-gear. The machine was unhurt, but as the undercarriage was not working properly Mr. Koolhoven refused to allow the machine to start. The previous day Major Draper had flown it round the course at a speed which would have put it somewhere between the Martinsyde and the Skinned Bat in the Derby.

Mr. Marcus Manton put up a very good performance on a D.H. (Airco) 4 with a 375-h.p. Rolls-Royce, and finished slightly in front of Major Draper, who had started just in front of him.

Another pilot who had bad luck was Major C. H. C. Smith, D.S.C., who started on a Bristol monoplane with a 110 h.p. Le Rhône. His start showed him to be a very able pilot, and the known speed of the machine should have assured him a place in the Handicap. Unfortunately his engine went wrong, and he came in at the end of the first lap far behind his proper time, with his engine missing badly. His landing was beautifully judged and confirmed the impression made by his start.

Major Carr on one of the Grahame-White single-seaters also fell out on the first lap owing to engine trouble, Capt. Chamberlayne on the other G.-W. failed to finish the second lap.

Lieut.-Colonel Henderson was entered to fly another F.4 Martinsyde, but was stopped by the Air Ministry, so he started pluckily on a standard Avro, but was handicapped too heavily to make a show at the finish. Captain Saint, on a D.H.9, also finished the course.

Altogether the race was well worth seeing, but, except for Mr. Jaines' exhibition on the Nieuport, there was little of interest while the competitors were away. Presumably shortage of machines and pilots prevented the pylon-racing which used to take place in the dull moments of the Aerial Derbys before the war. Still, no doubt matters will improve in future if Mr. Isaac continues his connection with the aerodrome and if he is given a free hand.—C. G. G.

Some Technical Notes.

(1) Bat "Bantam."—The Bat "Bantam" flown by Mr. C. B. Prodger was a standard machine of the type already described in The Aeroplane.

The principal dimensions of the machine are:—Span, 25 ft.; gap, 2 ft. 3½ ins.; length, 18 ft. 5 ins.; area of wings, 185 sq. ft.; engine, "A.B.C., 170 h.p., Wasp; speed at ground level, 138 m.p.h.; weight (loaded), 1,333 lbs.

(2 and 5) Grahame-White "Bantam."—Two Grahame-White "Bantams" started.

The principal dimensions are:—Span, 20 ft., gap maximum and minimum of 3 ft. and 2 ft. 9 ins.; length, 16 ft. 6 ins.; area of wings, 130 sq. ft.; engine, 80 h.p. (le Rhône); speed low down, 100 m.p.h.; weight (loaded), 995 lbs.

(3) Bat "Bantam."—This machine, flown by Major Draper, D.S.C., was also a standard machine, except that the lower plane had been cut down to a point just outside the first set of interplane struts, which gave the machine an appreciable increase of speed. The resultant overhang of the top plane was braced by inclined struts, the aileron-control wires being taken along this inclined strut and over pulleys to the single ailerons on the top plane.



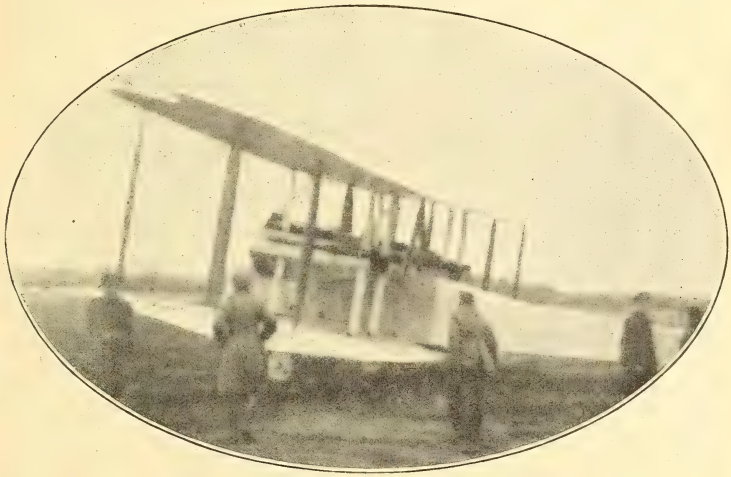
THE WINNING MACHINE.—Captain Gathergood's Airco D.H.4, with a Napier "Lion" Engine (450 h.p.), which won the Aerial Derby.

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STARTERS, TIMES, AND HANDICAPS.

Pilot.	Machine.	Engine.	Actual Time hr min sec	Handicap hr min sec	Hand'p Time hr min sec
1. Capt. G. Gathergood, A.F.C.,	Airco D.H. 4R	450 h.p. Napier	1 27 42	Scratch	1 27 42
2. Lieut R. Nisbet	Martinsyde F.4.	275-h.p. Rolls	1 31 3 3/5	0 4 0	1 27 3 2/5
3. Marcus D. Manton	Airco D.H.4.	375-h.p. Rolls.	1 36 41 4/5	0 9 30	1 27 11 4/5
4. Major C. Draper, D.S.C.,	B.A.T. Bantam	170-h.p. A.B.C.	1 37 7	0 13 20	1 23 47
5. Capt. H. J. Saint, D.S.O.,	Airco D.H.9.	240-h.p. B.H.P.	1 51 55	0 23 30	1 28 25
6. Lt.-Col. G. L. P. Henderson, M.C., A.F.C.	Avro.	110-h.p. Le Rhône	2 30 45 1/5	0 57 0	1 33 45 1/5
7. Capt. H. A. Hamersley, M.C.	Avro "Baby."	35-h.p. Green.	2 41 23	1 25 0	1 16 23

(4) AVRO TWO-SEATER BIPLANE, TYPE 504K.—Lieut.-Colonel Henderson was unable to procure a Martinsyde F 4 biplane, with which he entered, so flew an ordinary standard "Avro." This machine has already been fully described in THE AEROPLANE. Principal dimensions are:—Span, 36 ft.; length, 29 ft. 5 ins.; engine, 1,100 h.p. (le Rhône); weight (loaded), 1,829 lbs.

(7) THE AIRCO 4R.—The Airco 4R appeared to be a standard Airco 4 very hurriedly altered to take the 450 h.p. Napier "Lion" engine. The fuselage had been shortened in front and a square radiator bolted on. On the top of the fuselage was installed the Napier "Lion" engine driving a four-bladed airscrew. The main planes had been rigged back to get rid of the stagger and the bottom plane cut short outside the first set of interplane struts. The overhang of the top plane was supported by struts running out from the base of the interplane struts. The aileron control wires ran along the leading edge of the lower plane, over pulleys and up the diagonal strut to the leading edge of the upper plane to the ailerons in the customary Airco manner. With the 450 h.p. Napier "Lion" engine it gives a speed of about 145 m.p.h.

(8) THE AIRCO 4.—This machine was standard type except the fairing had been placed over the rear cockpit, making the machine a single-seater. Dimensions:—Span, 42 ft. 4⅛ ins.; gap, 5 ft. 6 ins.; length, 30 ft.; surface, 434 sq. ft.; engine, 375 h.p. Rolls-Royce "Eagle" VIII; speed, 130 m.p.h.

(9) THE AIRCO 9.—Also a standard machine, with the exception that an additional seat was provided in front of the usual pilot's seat just under the centre section, making it a three-seater. Span, 42 ft. 4⅛ ins.; gap, 5 ft. 6 ins.; length, 30 ft. 10 ins.; surface, 434 sq ft.; engine, 240 h.p. Siddeley "Puma"; speed, 110 m.p.h.; weight, 3,800 lbs.

(10) THE MARTINSYDE F4 BIPLANE.—The Martinsyde single-seater biplane was a standard machine of the type that beat all records some time ago for climb and speed at height, but was not adopted by the Government until it was too late for the machine to demonstrate what it could do in the sphere for which it was designed. It is fitted with Rolls-Royce "Falcon" engine, which gives it a speed of about 145 m.p.h.

(11) THE NIEUPORT NIGHTHAWK.—The Nieuport single-seater biplane was a standard single-seater biplane of a type adopted by the Government just previous to the signing of the Armistice. Generally speaking, it looks like a Snipe, with an A.B.C. Dragonfly engine and an S.E 5 tail. After putting up a remarkably fine performance it was compelled to retire at West Thurrock owing to a punctured float. It certainly caused an impression at Hendon, but one is inclined to wonder if it was its wonderful manœuvreability in the air or its resplendent "racing colours" that attracted most attention. Dimensions:—Span, 28 ft.; gap, 4 ft. 6 ins.; length, 18 ft. 6 ins.; surface, 270 sq. ft.; engine, A.B.C., 320 h.p. "Dragonfly"; weight, 2,120 lbs.; speed, 151 m.p.h.

(12) BRISTOL MONOPLANE.—The Bristol was the only machine of the monoplane breed competing, and unfortunately was compelled to retire at the end of the first lap owing to trouble with the oil pump. The fuselage is of circular streamline form, and it has a huge vermilion spinner on the airscrew boss. The wings are of curious form, in that the leading edge is crescent-shaped, giving it the appearance when in the air of having bird-form wings, and reminded one of the old Handley Page monoplanes and biplane that used to fly at Hendon in 1912-13. Dimensions: Span, 30 ft. 9 ins.; length, 20 ft. 4 ins.; surface, 145 sq. ft.; engine, 110 h.p. le Rhône; weight, 1,300 lbs.; speed, 130 m.p.h.

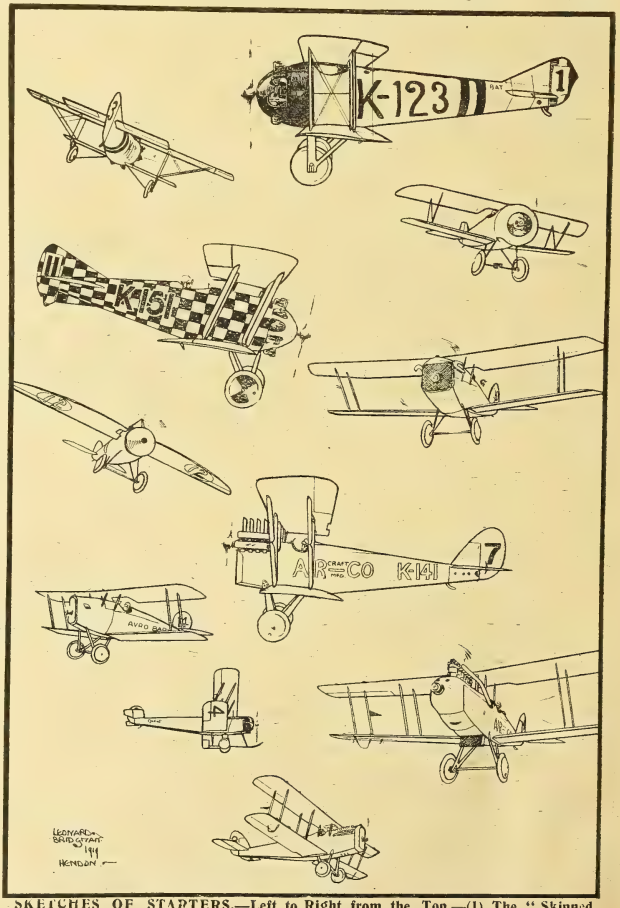
(14) AVRO "BABY."—This little machine put up a wonderful performance in completing the course and winning the "Shell" trophy in the sealed handicap. It has already been described in THE AEROPLANE. Dimensions:—Span, 25 ft.; gap, 4 ft. 6 ins.; length, 17 ft.; surface, 201 sq. ft.; engine, 35 h.p. Green; weight, 857 lbs.; speed, 78 m.p.h.

RESULTS.

The "Daily Mail" Gold Cup (value 200 guineas) and the "Shell" Prize of £500 were won by Capt. Gathergood.

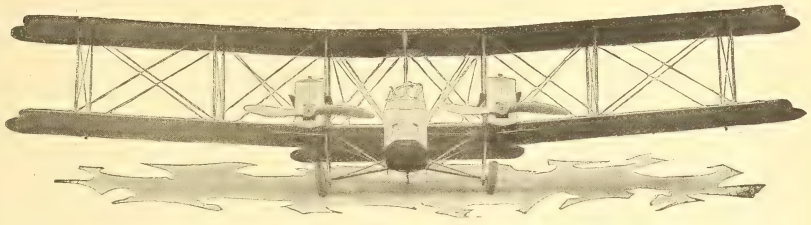
The Second Prize, the "Shell" Trophy and £100, was won by Lieut. Ronald Nisbet.

The Sealed Handicap Prizes of "Shell" Trophies and Prizes of £100, £50, and £25 were won by:—1. Capt. H. A. Hamersley, M.C.; 2. Major C. Draper, D.S.C.; and 3. Lieut. R. Nisbet.

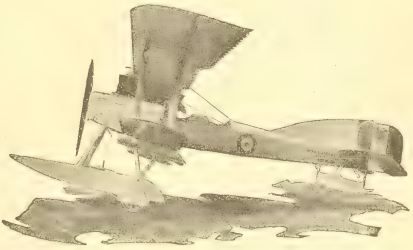


SKETCHES OF STARTERS.—Left to Right from the Top.—(1) The "Skinned Bat"; (2) The Standard Bat; (3) The "Jazz" Nighthawk; (4) The Grahame-White "Dasher"; (5) The Red-nosed Bristol; (6) The Martinsyde "Mother"; (7) The Avro "Baby"; (8) The Airco "Lion"; (9) The Standard Avro; (10) The Airco "Puma"; (11) The Airco "Rolls-Royce."

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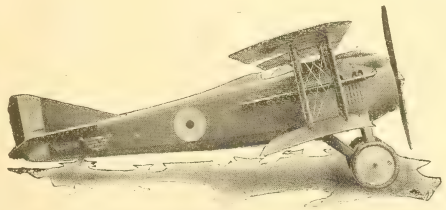
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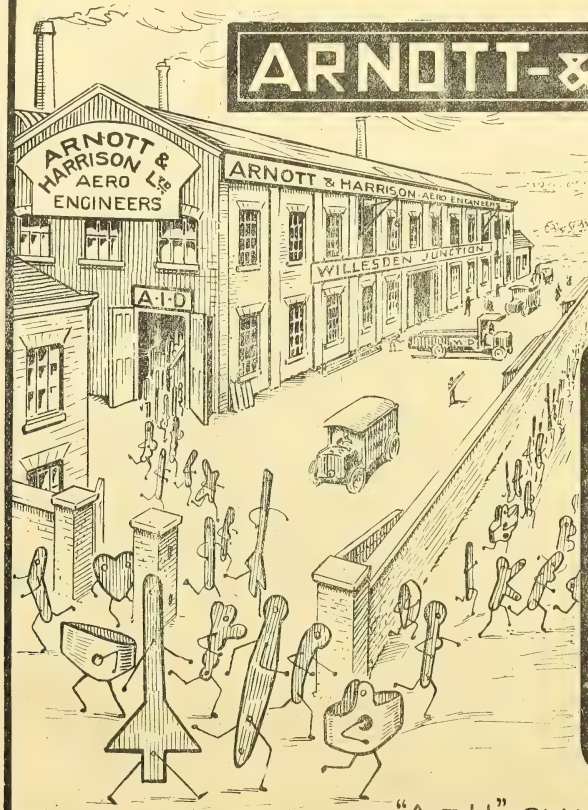
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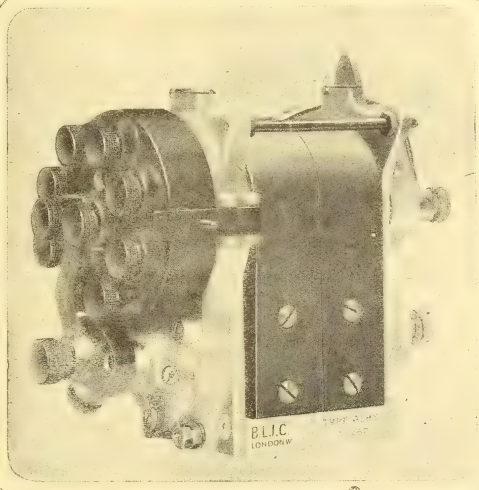
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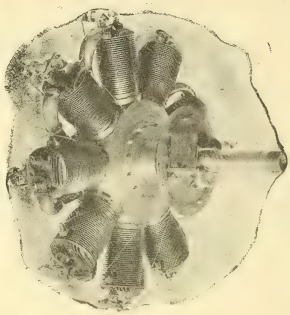
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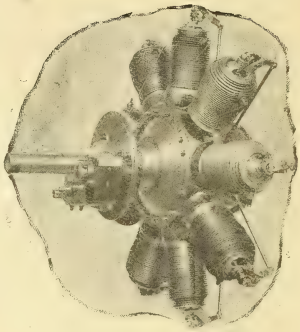
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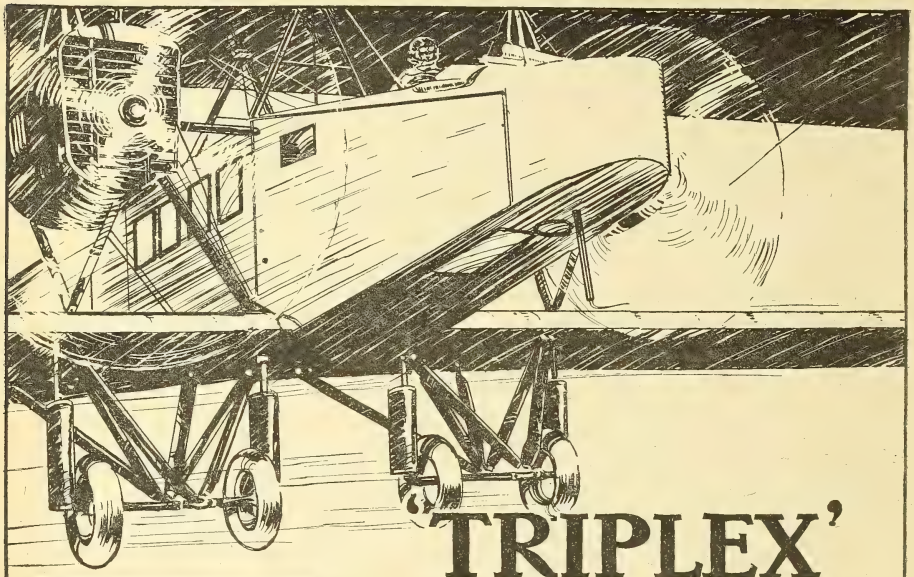
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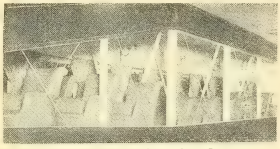
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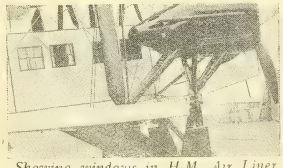
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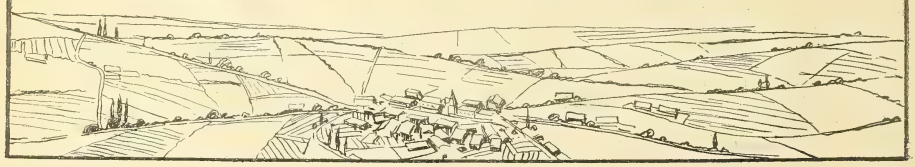
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THE WEEKLY COMMENTARY.

The possibilities of the Diesel type of engine for commercial aviation are considered in an article on "The Development of the Aero Engine" by Capt. Sayers in this number.

For some little while such engines will be heavy as compared with petrol engines, but the possibilities of reliability which may be obtained, together with the almost total abolition of fire risk due to the substitution of heavy oil for petrol, may more than compensate for the extra weight.

The description of the aeroplanes produced by the British Aerial Transport Company is continued in this issue.

The type F.K.26 commercial passenger machine is worthy of special notice. It is one of the handsomest machines that have yet been built, has an extraordinarily fine performance, and handles as easily as a single-seater fighter.

No adjustment of any kind has been found necessary to the machine, which was in perfect trim and balance on its first trial flight.

A report of the Wilbur Wright Memorial Lecture, read before the Royal Aeronautical Society by Mr. Leonard Bairstow, O.B.E., F.R.S., on Wednesday, June 18th, starts in this number.

An account of a visit to the works of the Cosmos Engineering Company, Ltd., at Bristol, appears on page 2534.

THE DEVELOPMENT OF THE AERO-ENGINE, PAST AND FUTURE.—III.

By Capt. W. H. SAYERS, late R.A.F.

In all probability the aero-engine of the not very distant future will be shorn of quite a number of the adjuncts which now cause breakdown.

The Antoinette of 1907 had no carburetter, but employed pump injection of petrol to each cylinder on the induction stroke.

Fuel Injection.

A petrol pump and distributor is admittedly a more complicated mechanism than is a carburetter; but, on the other hand, it is in many respects less sensitive to accidental derangement. A positive piston pump can be relied on to deliver a definite quantity of petrol per stroke, and it is unlikely that a minute fragment of solid matter, or even a drop of water in the petrol, will entirely upset the fuel supply. Moreover, if petrol in liquid form is squirted into an already hot cylinder, there is little risk of ice forming upon the petrol jets.

Even applied directly to present types of engine, the Antoinette system presents a number of advantages.

It dispenses with the need for water-jacketed induction pipes—in fact, it abolishes induction manifolds and all their attendant gas distribution difficulties at once.

On the other hand, particularly when applied to petrol, the method has its own drawbacks.

Petrol and all similar volatile hydro-carbons possess singularly penetrative habits, and it is extremely difficult to design a satisfactory plunger petrol pump. No other type of pump seems suitable, since accurate measurement of the charge given to each cylinder is necessary, together with easy means of varying that measure.

Heavy Oil Engines.

With heavier oils the design of a suitable pump becomes simpler, but heavy oils mean either the adoption of the Diesel system or some special arrangements for vaporisation and ignition of the fuel, at least at starting.

With the Diesel system ignition is automatic, and therefore both carburetter and ignition gear failures vanish. In place thereof there is a risk of failure on the part of the fuel injection system, but there should be a large net gain in reliability.

To obtain automatic ignition it is necessary that the air in the cylinder shall be raised to a temperature sufficient to ignite the fuel when it is injected at the top of the compression stroke. This means that the compression must reach 400 to 500 lbs. per sq. in.—a very much higher figure than that of any petrol engine, and consequently the mean effective pressure and the maximum temperature are both high.

The Disadvantages of the Diesel Type.

Unfortunately the maximum pressure is increased in a larger proportion than is the mean effective pressure. Thus a Diesel cylinder gives an output of energy per stroke considerably greater than that given by a petrol engine cylinder of the same dimensions, and if the two are run at the same number of strokes per minute the Diesel cylinder will give a much larger horse-power.

This naturally means stronger, therefore heavier, cylinders, pistons, connecting rods, crankshaft, etc., which have to be proportioned for the maximum pressure and not for the mean effective pressure. The weight of the engine proper thus increases at a greater rate than does the M.E.P. and the horse-power developed, and the Diesel type engine is essentially a heavier power plant than is the usual type of petrol engine.

Not only is this the case, but the higher working pressure and temperature produce certain difficulties of cooling. Not that more heat has to be carried away by the cooling water in this type, for the thermal efficiency

is higher and the waste heat to be disposed of is less for a given output than in other types of engine.

But the maximum temperature of the burning gas is very high, and, unless special care is taken in regard to cooling, local overheating, leading to distortion or even fracture of the cylinders and pistons, may occur.

Rapid local dissipation of heat is, of course, hindered by the necessary increased thickness of the cylinder walls and head, and, therefore, the design of cooling water passages calls for great care, and for fairly large water spaces around the cylinder head.

Altogether there is little likelihood of the Diesel type of engine competing with present aero-engines in the matter of weight per horse-power.

Possibilities with Large Units.

For really large powers it may be possible to build such engines at reasonable weights. For instance, a 1,000 h.p. unit at 5 lbs. per h.p. might be possible to-day, but a 100 h.p. unit of the type could probably not be made for much less than 800 lbs.

For the 1,000 h.p. unit the weight of radiators and cooling water would be round about 1,000 lbs., and the fuel and oil consumption per hour should not exceed 400 lbs.

For 1,000 h.p. of petrol engine, water-cooled, the weight of engine will be 2 lbs. per h.p., weight of water and radiator at least the same as that required by the Diesel engine, and the fuel and oil consumption cannot be safely put at less than 500 lbs. per hour.

Thus the relative weights for 1,000 h.p. would be :—

Diesel	5,000 + 1,000 = 6,000 lbs.
Petrol	2,000 + 1,000 = 3,000 lbs.

The Diesel unit thus will weigh not less than twice the petrol unit (3,000 lbs. extra), but will save 100 lbs. weight of fuel per hour, bringing it to equal total weight when carrying 30 hours' fuel, which is not at the moment a condition likely to be called for.

The Importance of Engine Weight.

At the same time it has to be recognised that this extra weight of 3,000 lbs. in a 1,000 h.p. power unit is of rather less importance than would at first appear for commercial purposes. Roughly, one can reach 100 m.p.h. for a gross weight of 18 lbs. per h.p., and a 1,000 h.p. 100 m.p.h. machine will therefore weigh about 18,000 lbs. With the petrol engine at 3,000 lbs. there should be about 8,000 lbs. available for fuel, oil, and cargo, reduced to 5,000 lbs. if the heavier engine is used.

Five hours' fuel for the petrol engine will weigh 2,500 lbs., leaving 5,500 as a useful load. With the Diesel type the fuel weight will be 2,000 lbs., leaving only 3,000 lbs. paying load capacity.

This is, of course, a very great reduction, but it might be worth while if it were possible to obtain real reliability and freedom from risk of fire.

For machines designed for lower speeds the importance of engine weight is greatly reduced.

Thus for a maximum speed of 75 m.p.h. the total weight of the 1,000 h.p. machine would increase to about 30,000 lbs., and the total disposable weight would become about 16,000 lbs. with the petrol engine, or 13,000 with the Diesel. Allowing for 7 hours' fuel in this case to give roughly the same radius of 500 miles, with the petrol engine the useful load is 12,500 lbs., and with the Diesel 10,200 lbs.

This is certainly not a prohibitive price to pay for reliability and abolition of fire risks.

There is therefore an opening for a type of engine of appreciably greater weight/power ratio than that now obtained with petrol engines, particularly for large and relatively slow machines, if such engines can be made absolutely trustworthy, and there is not the slightest doubt that a Diesel type engine of 1,000 h.p. could be produced at some weight round about 5 lbs. per h.p. if the same energy were devoted to the task as has been devoted to the improvement of the aero-engine during the last five years.

The Improbability of British Developments.

It is extremely unlikely that anything of the sort will be done in this country.

Four and a half years of war under a Government entirely devoid of either foresight or hindsight, which has met every kind of trouble by a system of disguised —sometimes very thinly disguised—bribery, which has educated both labour and the manufacturer into believing that they have only to demand whatever ridiculous price they may think fit for their services to obtain it, has made this country no place in which to embark upon research work of an inherently expensive type.

There is, however, the practical certainty that Germany, which has always been an industrious and thrifty country, and which after its war experiences is more than ever used to working hard for its living, will become more and more the centre of engineering development.

Even under the stress of war the German aircraft industry has kept its eyes upon the future, and it is now in a better position to produce useful commercial aircraft than that of any other country.

[One gathers that a German Diesel aero-engine is already in course of production.—Ed.]

It is idle to imagine that any peace treaty terms, commercial boycotts, or system of tariffs will prevent Germany from reaping the benefits of her industry. It may be possible for this country to live in its fools' paradise of laziness for a few years longer behind such artificial shelters, and it may be that Germany will suffer considerably during that period.

Adversity has never yet had any but a strengthening effect upon a great nation—indolence and extravagance invariably lead to decay—and the longer the present state of affairs is prolonged by artificial means the greater will be the disaster to this country when the crash comes.

British aero-engine makers can scarcely be expected to reorganise the economics of the whole country, but if they will condescend to take rather more thought for the future than they have as yet shown any signs of doing they may improve their chances of survival in the lean years which at the moment appear to be inevitable.

A NEW RIGID AIRSHIP.

According to notices appearing in the daily Press, the new rigid airship, R39, now under construction at the works of Sir W. G. Armstrong Whitworth and Co., Ltd., Barlow, near Selby, Yorkshire, is to have an overall length of 685 feet, a maximum diameter of 85 ft. and a gross lift of 80 tons. The power plant is said to consist of six engines of 350 h.p. each, and it is hoped that the speed attained will be over 70 m.p.h.

A POINT FOR DESIGNERS.

In "Engineering," of June 6th, Mr. A. J. Sutton Pippard, M.Sc., A.M.I.C.E., late of the Technical Dept., Dept. of Aircraft Production, points out that the side-wind pressure due to side-slipping imposes a lateral load upon the interplane struts of an aeroplane, additional to the normal load carried in straight flight.

The note gives a method of estimating this effect and of designing struts to meet such loads.

Mr. Pippard's curves show that the importance of this effect is only great in the case of relatively long slender struts.

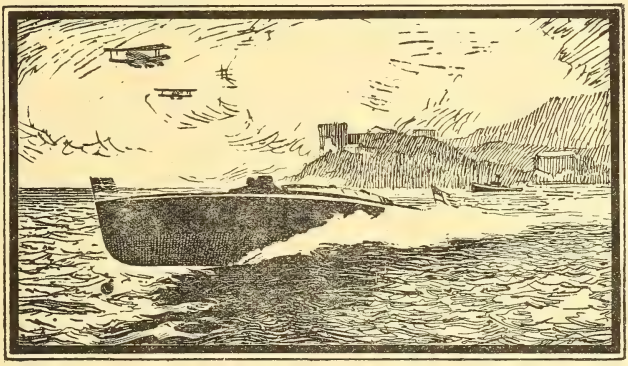
A 900 H.P. SUNBEAM ENGINE.

According to the "Daily Express" of May 11th, the Sunbeam Motor Car Co., Ltd., have just made preliminary tests of a new 12-cylinder "Vee" type engine of 900 normal b.h.p.

No other information is as yet available.

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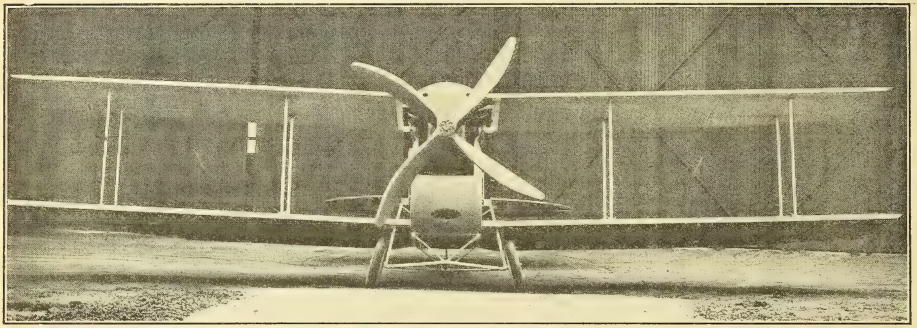
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MODERN BRITISH AEROPLANES.

VI.—The British Aerial Transport Co., Ltd.

(Continued.)



Front View of the B.A.T. F.K.26 Commercial Machine (375 h.p. Rolls-Royce Engine).

THE B.A.T. F.K.26.

The B.A.T. F.K.26 produced by the British Aerial Transport Co, Ltd., to the designs of Mr. Frederick Koolhoven, appears to be the first aeroplane primarily designed as a commercial machine which has been successfully tested since the Armistice. It is a tractor biplane, and is capable of carrying in the specially designed cabin either four passengers or their equivalent weight in goods or mails.

The fuselage is very deep and embodies two forms of construction, the front half being made up of six formers covered with three-ply, the rear half following normal practice in wire-braced girder construction.

The power unit, a 375 h.p. "Eagle" Mark VIII Rolls-Royce engine, is mounted on ash engine bearers carried between the first and second formers. Between the second and third formers, which are more or less bulkheads, are carried the petrol tanks, which have a capacity sufficient for six hours' flying.

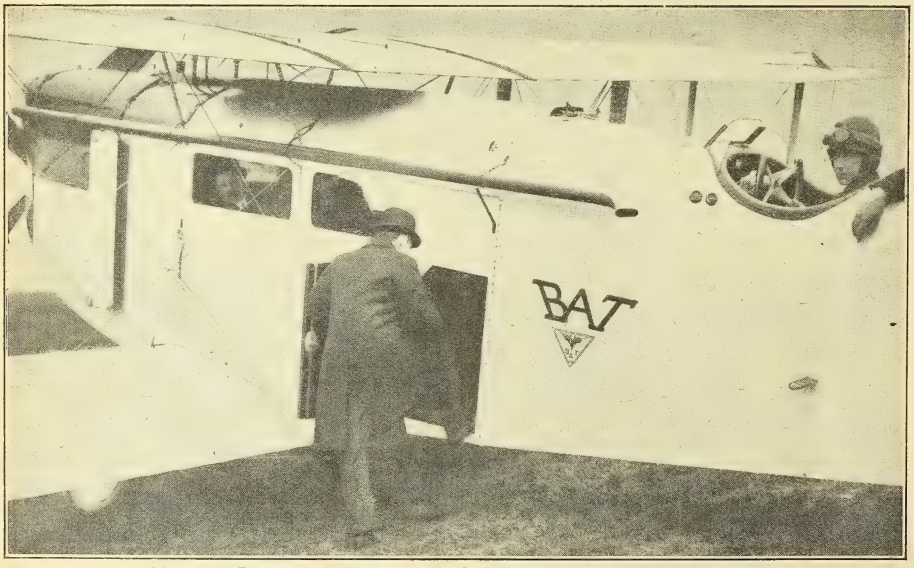
The space from the third to the fifth formers forms the cabin, the fourth former being left open, that is, it has no cross members or three-ply filling, as in the second, third, and fifth formers, the last two forming the front and rear "walls" of the cabin.

Aft of the cabin the wire-braced construction begins, and consists of a girder of six bays, the pilot's seat being situated between the second and third cross-members and well up in the fuselage, thus giving him an excellent view all round.

From the cabin aft the sides of the fuselage are fabric-covered, with a top fairing of three-ply.

The controls are similar to those of the old Deperdussin monoplanes, and consist of an inverted U-shaped member pivoted at the flooring of the cockpit, on which is mounted a wheel which has two segments cut from it top and bottom, as shown in the sketch of the pilot's cockpit.

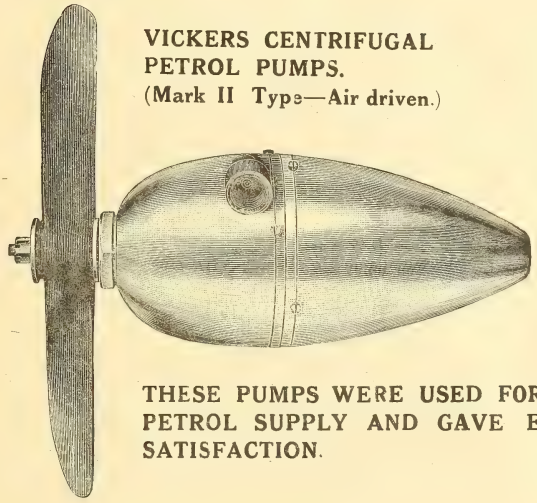
The elevators are operated by two oval section tubes connected at their front ends to points one on either side halfway up the inverted U and at their rear end to crank-arms on the underside of the elevators, thus giving direct pull and push action.



View of the Exterior of the Cabin of the B A.T. Passenger-carrier showing the side entrance)

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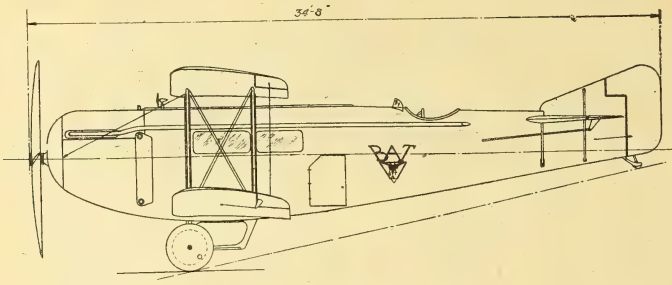
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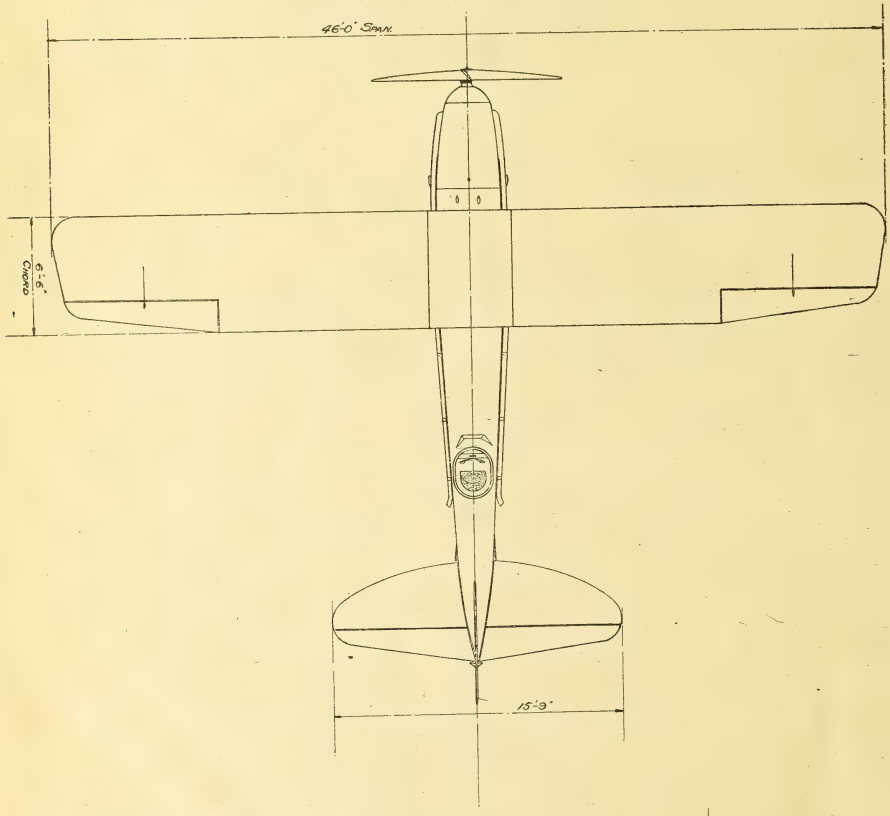
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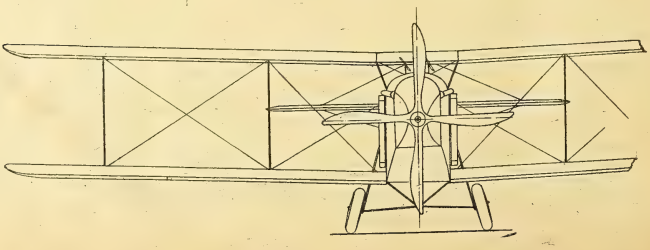
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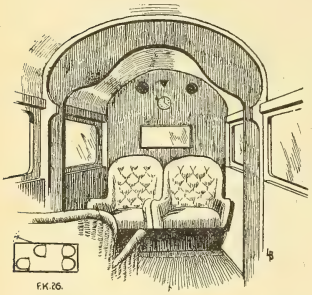
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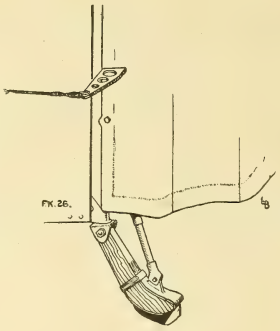
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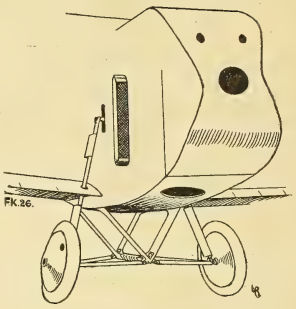
C.D C.



The Cabin (with plan sketch on left)



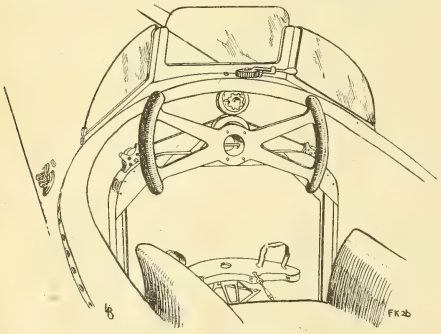
Tail Skid.



Chassis and Radiator.

The rudder control consists of the usual foot-bar.

The tail plane is adjustable, the actuating gear being operated by a wheel situated low down on the left-hand side of the pilot's seat, which is connected to a threaded spindle by a continuous cable. Above the tabular nut on the spindle is a collar connected to the front main spar of the tail plane by means of four



The B.A.T. F.K.26 Passenger Carrier showing the Pilot's seat and the cut-away wheel control.

tubes, two inside the fuselage either side of the central tube, and two streamline tubes running out the wings either side of the fuselage to a point on the front main spar of the tail plane.

The under-carriage consists of two Vees set across the fuselage, the apexes of which are connected fore and aft, and from the Vees two divided axles, two on either side, meet at a wheel hub. From the hubs two tubes run up to two levers which just project through the sides of the fuselage and which are pivoted at their innermost ends to the centre of the third fuselage former. The levers are connected near their outer ends to an oleo and elastic shock-absorber. A sketch is given of the general arrangement of the under-carriage and also of the shock-absorbing device.

The main planes are of equal span, and are connected to upper and lower centre sections, the latter, consisting of two small false wings attached to the side of the fuselage which, with the width of the fuselage, are the same span as the upper centre section, thus the upper and lower main planes are of the same length and consequently interchangeable.

The spars of the lower centre section pass right through the fuselage and are built into the third and fourth formers.

Two pairs of interplane struts are fitted on either side of the fuselage, braced with streamline wires.

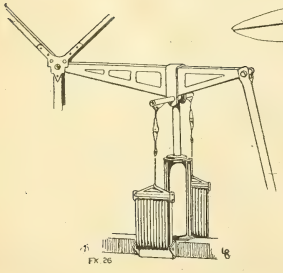
The empennage, of which a sketch is given, is of conventional design, except in plan form.

The tail skid is pivoted to the base of the rudder and a pair of telescopic tubes containing a spring run from the toe of the skid to a lug some distance up the rudder post.

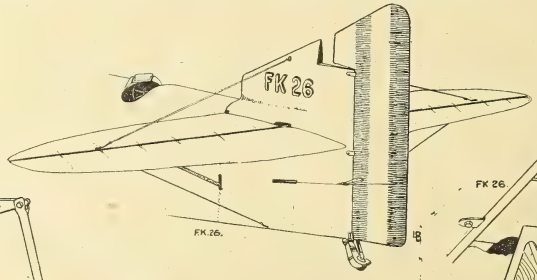
The engine-cooling system consists of two long honeycomb radiators which are carried on either side of the fuselage and connected to two water-tanks inside the fuselage, the temperature therein being controlled by two shutters operating at the back of the radiator.

The oil-tank has an extension which projects throught the side of the fuselage and which has a series of tubes passing through it, thus forming an oil-cooler.

The following table gives the main particulars of this machine:

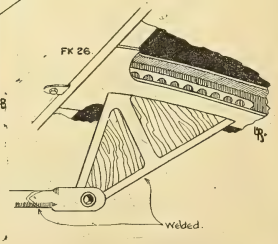


The Internal Shock Absorbers.



The Tail Unit.

The B.A.T. F.K. 26 Passenger Carrier. Some Details.



The Elevator Lever.

(Continued on page 2533.)

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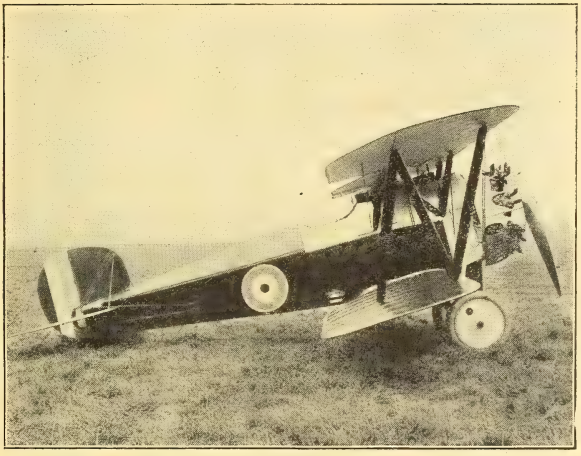
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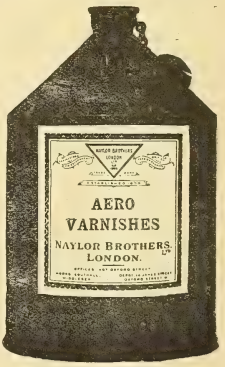
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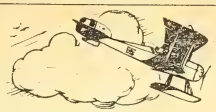
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Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle - on - Tyne. "Armstrong Aviation, Newcastle-on-Tyne" Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)

Boulton & Paul, Ltd., Rose Lane, Norwich, "Aviation, Norwich" Norwich 851.

British Aerial Transport Co., Ltd. Head Office: 18, Conduit Street, London, W.1 "Batigram, Rego, London" Mayfair 657, 658.
Works: Hythe Road, Willesden, London, N.W.10. "Aerobrians, Phone, London." Willesden, 2272, 2273.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol" Bristol 3006.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hampstead 5551.

Central Aircraft Co., High Road, Kilburn, N.W.6. "Avidiction, Phone, London." Willesden, 2272, 2273 and 4424.

Dawson, John, & Co., Ltd., Newcastle-on-Tyne. "Dependable, Newcastle-on-Tyne." Central 2604 (2 lines).

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne" Eastbourne 1170.

Gosport Aircraft Co., Gosport. "Flight Gosport." Gosport 217.

Grahame-White Company, Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.
London Office, 12, Regent Street, S.W.1 Regent 2604

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2 "Hydrochid, Crickle, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St James, London." Regent 912.

Manu, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines)

Martinsyde, Ltd., Brooklands, Byfleet, "Martinsyde, Weybridge" Woking 334; Byfleet 171.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscout, Crickle, London." Willesden 2455

Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford" Bradford 3700 (4 lines).

The Regent Carriage Co., Ltd., 126/132, New Kings Road, Fulham, S.W.6. "Carbodia, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester" City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes" Cowes 195.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tasted, Phone, London." Regent 676.

The Siddeley Deasy Motor Car Co., Ltd., Coventry. Coventry 954 "Deasy, Coventry."

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston" Kingston 698 (8 lines).

The Supermarine Aviation Works, Ltd., Southampton. "Supermarin" Woolston 37 (2 lines).

Tarrant, W. G., Byfleet, Surrey "Tarrant, Byfleet" Byfleet 1, 2 & 3.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3 "Vickersfyto, Knights, London" Kensington 6010

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5900.

Westland Aircraft, Yeovil "Aircraft, Yeovil" Yeovil 129

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes" Cowes 3.

Airships—
Airships, Ltd., High Street, Merton. Wimbledon 1314.

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central (5 lines)

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 676.

C. G. Spencer and Sons, Ltd. (See under "Balloons").

Aluminium Castings (Sand and Die)
Coan, R. W., 210, Goswell Road, London, E.C.1 "Krankases, Isling, London" City 3846

Balloons—
The North British Rubber Co., Ltd., Castle Mills, Edinburgh "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

C. G. Spencer and Sons, Ltd., 504, Highbury Grove, N.5. "Aeronaut, London." Dalston 1893

Bent Timber Parts—
Hopton & Sons, George Street, Euston Square, London, N.W.1 "Hoptons, Euston, London" Museum 496.
Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Bearings (Etonia Cast Phosphor Bronze)
Brown Bros., Ltd., 61 Eastern St., E.C.1
Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds" Central 3927.

Blowpipes (Oxy-Acetylene)—
Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1 "Flamma, Vic, London" Vic 4830
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Vic. 3540 (3 lines).

Bolts—
Mitchell Wedgewood & Co., Campbell Works, Stoke Newington, London, N.16 Dalston 2500 (2 lines).

Books (Aero Engines)—
Dykes' Auto Encyclopedia, Gillam, 149, Strand, W.C.2

Buildings—
Boulton & Paul Ltd., Rose Lane, Norwich "Aviation, Norwich." Norwich 851
Rubery Owen & Co., Darlaston, South Staffs

Cable Coverings and Cable Controls—
The Bowden Brake Co., Ltd., Tyseley, Birmingham. "Bowden, Acock's Green" Acock's Green 103 & 104

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Carburettors—
Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.2. Victoria 4070

Casein—
Nienwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3 "Suricodon, Fen, London." Avenue 34 and 35

Clothing—
Burberry's, Ltd., Haymarket, S.W.1 Regent 2165.

Dunhill's Ltd., Euston Road, N.W.1 "Dunsend, London." North 3405-6.

The North British Rubber Co., Ltd., Castle Mills, Edinburgh "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Component Parts—
Accles & Pollock, Ltd., Oldbury, Birmingham "Accles, Oldbury." Oldbury 111 (4 lines)

Brown Bros., Ltd., 61, Eastern St., E.C.1.
Central Aircraft Co., High Road, Kilburn, N.W.6 "Avidiction, 'Phone, London." Hampstead 4403 & 4404.

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond "Acros, Richmond." Richmond 1681

Thompson Bros (Bilston), Ltd., Bradley, Bilston, England "Thompson Bros., Bilston" Bilston 10.

Cords, Tapes, and Threads—
MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

Dopes—
Titanine, Ltd., 175, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 4036

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London" Gerrard 280.

Cellon, Ltd., 22, Cork Street, London, W.1. "Ajawb, Reg, London." Gerrard 440.

Robt. Ingham Clark & Co., Ltd., West Ham Abbey, E.15. "Olcotine, Strat, London." East 955.

Engines and Parts—
Allen, W. H., & Co., Ltd., Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries" Dumfries 281-282.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

The Cosmos Engineering Co., Ltd., Fishponds, Bristol.

Dudbridge Iron Works, Ltd. (Salmson), 87, Victoria Street, London, S.W.1. "Aerofight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercedès, Weybridge" Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1203.

Gwynnes, Ltd., Hammersmith, W. "Gwynne, Hammersmith" Hammersmith 1910.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London" Gerrard 8926.

Rolls-Royce, Ltd., 14 and 15, Conduit Street, W.1 "Rolhead, London" Gerrard 1634-5-6.

The Siddeley-Deasy Motor Car Co., Ltd., Coventry. Coventry 954 "Deasy, Coventry."

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 985.

The Gnôme & Le Rhône Engine Co., Ltd., 27, Buckingham Gate, S.W.1. "Elevenfold, London." Walthamstow 811 (2 lines).

Walton Motors, Ltd., Walton-on-Thames. "Motors, Walton-on-Thames." Walton-on-Thames 220.

Electrical Accessories—
Belling & Co., Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1984.

Brown Bros., Ltd., 61, Eastern St., E.C.1.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, 'Phone, London." Willesden 2480.

Electric Cables—
E. Kalker and Co., Coventry. "Kalker, Coventry." Coventry 248.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 1564.

Electric Lighting and Power—
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207; London Wall 2561.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W. "Installing, Eusroad" Museum 70 (4 lines).

Electro Platers and Metal Polishers' Engineers—
W. Canning & Co., 131-137, Great Hampton Street, Birmingham. "Materials, Birmingham" Birmingham 3622 Central (3 lines)

Flare Lights—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).

Flexible Shafts—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.



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Fluxes—
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." Victoria 3540 (3 lines).
The Auto Controller Co. (Fluxite), Vienna Road, Bermondsey, Eng.

Flying Boat Builders—
Gosport Aircraft Co., Gosport. "Flight, Gosport." Gosport 217.

Galvanising—
Boulton & Paul, Ltd., Rose Lane, Norwich. "Aviation, Norwich." Norwich 851.

Gauges—
J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17
Voucher, Co., Auto Tool Works, Walsall "Voucher Walsall." Walsall 0196.

Gears—
Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham" East 407.

Glue—
Cannon, B., & Co., Ltd., Lincoln. London Office, 110, Cannon Street, E.C.4. "Beccofin, Cannon, London." City 1306

Improved Liquid Glues Co., Ltd., 61, Hermitage Street, E. (Croid.) "Excroiden, 'Phone, London." Avenue 4011-2

Mendine Co., 8, Arthur Street, E.C. Bank 5673.

Goggles—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London" Regent 1340

Heating and Ventilating—
Chas. P. Kinnell and Co., Ltd., 65 & 68, Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).
The Thames Bank (Blackfriars) Iron Co., Ltd., Upper Ground Street, London, S.E.1. "Hot Water, Friars, London." Hop 703

Instruments—
British Wright Co., Ltd., 13, Chancery Lane, W.C.2. Holborn 1308

Instruments (Scientific, Altimeters, etc.)—
Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

Insurance—
Aviation Insurance Association, 1, Royal Exchange Avenue, E.C.3. London Wall 6934.
Bray, Gibb & Co., Ltd., 160, Piccadilly, W.1.
S. Sackville & Sons, Duchy Chambers, 4, Clarence Street, Manchester.
Harold Townend, Ltd., 13-14, Abchurch Lane, King William Street, E.C.4. "Carinsur, London." Central 156 (2 lines).
Percy Wingfield, 22, Newgate Street, E.C.1. City 4672.

Leather Cloth—
New Pegamoid, Ltd., 134, Queen Victoria Street, London "Pegamoid, Cent, London." City 9704 (2 lines).

Lubricating Oil Refiners and Merchants—
W. B. Dick & Co., Ltd., 90, Fenchurch Street, E.C.3. Telegrams, Dicotto Fen, London. Avenue 7854 (2 lines)

Magneto Driving Pieces—
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Magnetos—
The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicksmag, Phone, London." Museum 430.
The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Astersidal, Coventry." Coventry 278.

Metal Casement Manufacturers—
Henry Hope & Sons, Ltd., 55, Lionel Street, Birmingham. "Conservatory, Birmingham" Central 409 (2 lines).

Metal Manufacturers—
Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham" Central 42-43. Avenue 1432.

Metals in General—
Samuel Mercer & Co., 108, Upper Thames Street, E.C.4 "Reconciled, Cannon, London" City 6542.

Metal Parts and Fittings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury" Oldbury 111 (4 lines)
Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.
Bayliss, Jones, & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1031
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds" Roundhay 345 (3 lines).
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., 61, Eastern St., E.C.1.
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1 "Installing, Eusroad, London." Museum 70
Rubery Owen & Co., Darlaston, South Staffs.
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire "Sankey, Wellington, Salop." Wellington 66.
The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London." Regent 1181.
The Tolmas Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Metric Bolts—
Cashmore Bros., Hildreth Street, Balham, S.W. Battersea 415.
Rubery Owen & Co., Darlaston, South Staffs.

Miscellaneous—
Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035
British Metal (Kingston), Ltd., Kingston-on-Thames.
Brown Bros., Ltd., Great Eastern Street, E.C.1 "Imbrowned, Bethroad, London" London Wall 6300.
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobrake, Birmingham." Central 793.
MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords, and Threads. City 3115.

Motor Cars—
Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.
Mann, Egerton & Co., Ltd., 279/281, Euston Road, London, N.W.1. "Manegecar, Eusroad, London." Museum 70.
Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels—
British Metal (Kingston), Ltd., Kingston-on-Thames.
The Clegg Metal Engraving Co., Worthing. "Clegg, Worthing"

Observation Panels—
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Oils—
C. C. Wakefield & Co., Ltd., Wakefield House, Cheapside, E.C.2. "Cheery, Cent, London" Central 11305 & 13466.

Parachutes—
E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savetnalive, Ave, London." London Wall 3266-3267.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)
C. G. Spencer & Sons, Ltd (See under "Balloons").

Piston Rings—
The Standard Piston Ring and Engineering Co., Ltd., Don Road, Sheffield. "Ocean, Sheffield." Sheffield 2149

Presswork—
Rubery Owen & Co., Darlaston, South Staffs.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Propellers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds "Propellors, Leeds." Roundhay 345 (3 lines).
Boulton & Paul, Ltd., Rose Lane, Norwich, "Aviation, Norwich" Norwich 851.
Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames "Ebora, Kingston." Kingston 672.
Integral Propeller Co., Ltd., "Aviprop, Hyde, London" Hendon 9 Kingsbury 104
Lang Propeller, Ltd., Weybridge "Aerosticks, Weybridge." Weybridge 520-521.
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich" Norwich 482 (4 lines).
Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Leeds 20547-8.
Westland Aircraft, Yeovil. "Aircraft, Yeovil." Yeovil 129.

Pyrometers—
The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth" Letchworth 26

Rawhide Hammers—
Ira Stephens, Whitelands Leather Works, Ashton under-Lyne. "Stephens, 709, Ashton." Ashton 709.

Rigging for Aircraft—
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield" Wakefield 466.

Rubber Tubing & Accessories—
Hancock, James Lynes, Ltd., 266, Goswell Road, London, E.C.1 "Masticator, Isling, London" City 3811 & 3812.
The North British Rubber Co., Ltd., Castle Mills, Edinburgh "Weba, Edinburgh." Edinburgh 3880 Central. (5 lines.)

Safety Belts—
C. H. Holmes & Son, 38, Albert Street, Manchester. "Semloh, Manchester" City 4432

Screwing Die Heads—
Voucher, Co., Auto Tool Works, Walsall. "Voucher Walsall." Walsall 0196

Screw-driving Machines—
Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch" Redditch 74.

Seaplane Manufacturers—
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds "Propellors, Leeds." Roundhay 345 (3 lines).
Mann, Egerton & Co., Ltd., Norwich. "Motors, Norwich." Norwich 482 (4 lines).
Phœnix Dynamo Manufacturing Co., Ltd., Thornbury, Bradford. "Dynamo, Bradford." Bradford 3700 (4 lines).
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.
Supermarine Aviation Works, Ltd., Southampton. "Supermarin, Southampton." Woolston 37

Searchlights & Landing Lights
Brown Bros., Ltd., 61, Great Eastern St., E.C.1
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London" Willesden 2480

Sheet Metal Pressings—
Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellors, Leeds." Roundhay 345 (3 lines)
British Metal (Kingston), Ltd., Kingston-on-Thames.
Rubery Owen & Co., Darlaston, South Staffs.

Sheet Metal Work—
The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, S.W.1. "Flamma, Vic, London" Vic 4830
British Metal (Kingston), Ltd., Kingston-on-Thames. [Staffs.
Rubery Owen & Co., Darlaston, South
The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsero, Phone, London."
Regent 1181
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

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Solder Manufacturers—

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Sparking Plugs—

Brown Bros., Ltd., Great Eastern St., E.C.1
Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.
Ripault, Leo., & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.
The Rollinhood Engineering Works, Ltd., Newlands, Putney Vale, S.W.15. Makers of KLG Plugs. "Kaclgee, Phone, London." Putney 2132-3.

Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.
Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

Steel—

Allen, Edgar, & Co., Ltd., Sheffield. "Allen, Sheffield." Sheffield 4607.
Brown Bros., Ltd., Great Eastern St., E.C.1.
Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.
Nickiin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.
Spear & Jackson, Ltd., Ætna Works, Sheffield. "Spear, Sheffield." Central 4522-3-4.

Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines)

Tapes and Smallwares—

MacLennan, John, & Co., 20, Newgate Street, E.C.1. And at Glasgow. City 3115.
C. E. Matthews & Co., Ltd., Castle Works, Bermondsey Square, S.E.1. "Webbance, Berm, London." Hop 4058.

Timber—

Hopton & Sons, George Street, Euston Square, London, N.W.1. "Hoptons, Euspuare, London." Museum 490. Also at Market Harborough, Leicestershire. "Hoptons, Market Harborough." Market Harborough 13.

Time Recorders—

Gledhill Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

Tools—

Richard Mather & Son, Shoreham Street Works, Sheffield. Sheffield 4349.

Turnbuckles—

Brown Bros., Ltd., Great Eastern St., E.C.1.
Rubery, Owen & Co., Darkaston, South Staffs.
Mann, Egerton & Co., Ltd., 117, Cleveland Street, London, W. "Installing, Euston." Museum 70 (4 lines).

Tyres and Wheels—

The North British Rubber Co., Ltd., Castle Mills, Edinburgh. "Weba, Edinburgh." Central 3880 (5 lines).
The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

Undercarriages—

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Varnishes—

The British Emaillite Co., Ltd., 30, Regent Street, S.W.1. "Ridleypren, Piccy, London." Gerrard 280.
Thomas Parsons & Sons, 315 & 317, Oxford Street, London, W.1. "Varjan, Phone, London." Mayfair 6347 (5 lines).
Robt. Ingham, Clark & Co., Ltd., West Ham Abbey, E.15. "Oleotine, Strat, London." East 955.
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

Washers—

Terry, Herbert, & Sons, Ltd, Redditch. "Springs, Redditch." Redditch 61.

Welding and Cutting Plant—

Acetylene Corporation of Great Britain, Ltd., The, 40, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.
Imperial Light, Ltd, 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." Victoria 3540 (3 lines).

Welding Repairs—

Imperial Light, Ltd, 123, Victoria Street, London, S.W.1. "Edibrac," Phone, London." Victoria 3540 (3 lines).

Wind Shields—

Auster, Ltd., 133, Long Acre, W.C. "Winflector, London." Regent 5910.
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

Wire Gauze—

Greening, N., & Sons, Ltd, 16, Finsbury Street, London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.

Wire and Cables—

Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (5 lines).

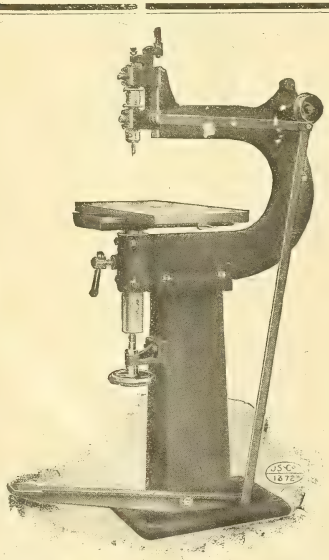
Wirework—

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Woodworking Machinery—

Robinson, Thomas, & Son, Ltd., Rochdale, "Robinson, Rochdale." Rochdale 467.
Sagar, J., & Co., Ltd., Halifax. "Sawtooth," Halifax." Halifax 136.
Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.

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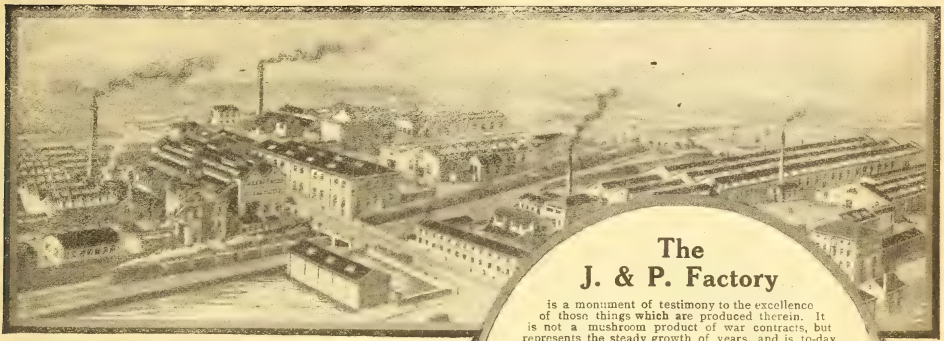
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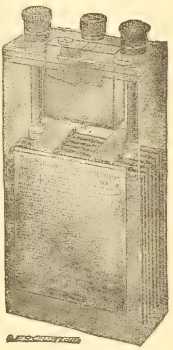
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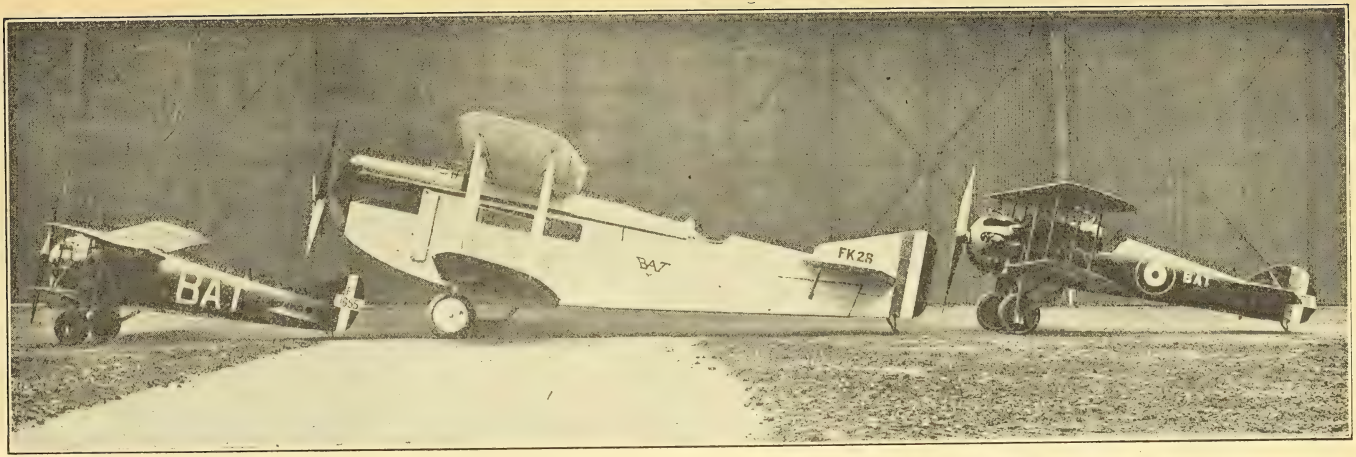
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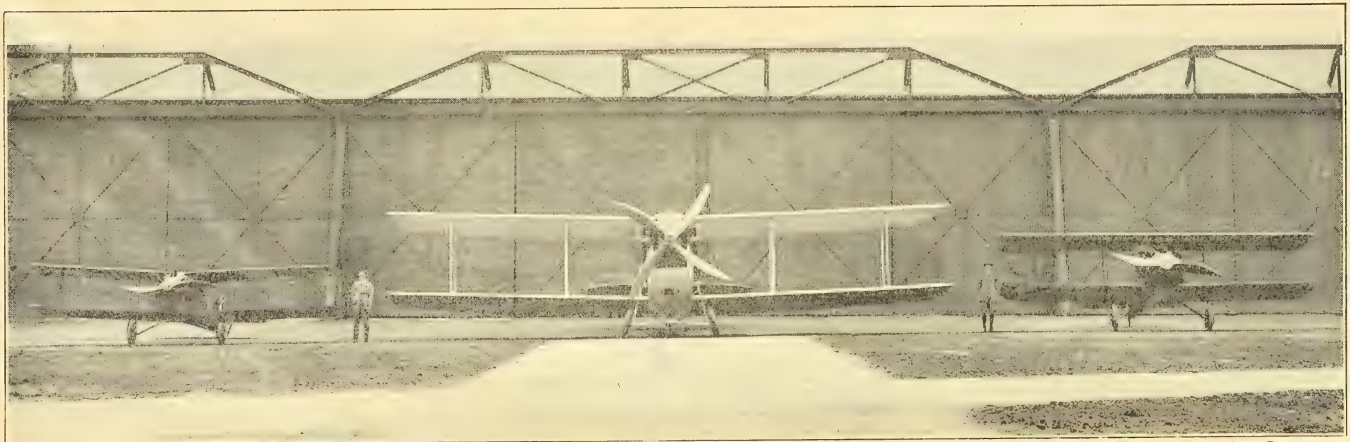
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SPECIFICATION.

Type of machine (pilot and 4 passengers)	Five-seater biplane
Name or type No. of machine	B.A.T. F.K.26
Purpose for which intended	Commercial passenger or mail carrying
Span	46 ft.
Chord	6 ft 6 in.
Gap, maximum and minimum	6 ft. 6 in.
Stagger	Nil
Dihedral	2 deg. on both wings
Overall length	34 ft. 8 in.
Overall height	11 ft. 3 in.
Total area of wings	580 sq. ft.
Ailerons	Top and bottom.
Area of each aileron and total area	4 × 13 sq. ft. = 52 sq. ft.
Span of tail	15 ft. 9 in.
Total area of tail	66.6 sq. ft. (including elevators).
Area of elevators	23.5 sq. ft.
Area of rudder	10.8 sq. ft.
Area of fin	8 sq. ft.
Maximum cross-section of body	20.5 sq. ft. approx.
Side area of body	142 sq. ft. approx.
Engine (type and max. b.h.p.)	350 h.p. Rolls-Royce "Eagle" 8
Propeller	B.A.T. 4-blade, 11 ft. dia. 8/6 in. pitch, 1025 r.p.m.
Weight of machine empty	2700 lbs.
Load per sq. ft	7.7 lbs.
Weight per h.p.	13.0 lbs.
Tank capacity in hours at ¾ throttle	6 hours.
Tank capacity in gallons	100 galls.
Disposable load apart from fuel	1,000 lbs.
Total weight of machine fully loaded	4,500 lbs.
Performance—	
Speed low down	122 m.p.h.
Speed at 10,000 ft.	110 m.p.h.
Landing speed	50 m.p.h.
Climb—	
To 5,000 ft.	4 mins.
To 10,000 ft.	10 mins.
Ceiling	18,000

A VISIT TO THE COSMOS ENGINEERING WORKS.

On Wednesday, June 15th, The Cosmos Engineering Company, Ltd., of Fishponds, Bristol, invited representatives of that portion of the Press which was interested to visit Bristol for the purpose of inspecting their works and watching trial flights of the Cosmos "Jupiter" engine in a Bristol two-seater. The party, including a representative of The Aeroplane, on arrival at Bristol were driven to the residence of Mr. J. A. Taylor, the managing director of the Cosmos Co., where the party—enlarged by the presence of Mr. Herbert Thomas and Capt. Barnwell of the Bristol Co.—were entertained at lunch.

After lunch Mr. Taylor, in a brief speech of welcome to the visitors, expressed his firm faith in the future of commercial aviation, and said that it was the ambition of the Cosmos firm to provide the locomotive of the aerial train of the future. The Press, generally, were the great educative organisation of modern times, and it largely depended on their attitude as to whether his hopes would be quickly fulfilled.

The Cosmos Co. had found it a great advantage that they had as such near neighbours the British and Colonial Aeroplane Company, and they were greatly indebted to them for the way in which their staff had assisted in the development of the Cosmos engine.

Mr. A. H. R. Fedden, the designer of the Cosmos engine, said that, as a West Countryman himself, it was his ambition to see a West Country aeroplane with a West Country engine in the very front rank, and, with the assistance of the Bristol Co., he believed that they were well on the way to success.

The company then adjourned to Filton Aerodrome, where a short exhibition flight was made on one of the Bristol company's new two-seater "Badgers," fitted with a Cosmos "Jupiter" engine of 450 h.p.

The engine started at the very first attempt, and the machine got away and flew—well, very much as one would expect a machine designed by Capt. Barnwell, with 450 h.p. for a total weight of 2,800 lbs., to fly.

Exigencies of time and space made the demonstration a short one and the party hurried away to Fishponds Works, where they inspected a "Jupiter" engine on the test bench, and a single-cylinder unit, of the same bore and stroke, running endurance tests.

A single-cylinder engine of 5¾-in. bore and 7½-in. stroke running at 1,000 r.p.m. and developing a mean effective pressure of round about 120 lbs. per sq. in., with open exhausts in a corrugated iron shed is a disquietening affair. A boiler shop is peaceful by comparison—and the main impression left is that Mr. Fedden has successfully devised a new and appalling form of frightfulness.

The Cosmos "Jupiter" engine has been described generally in The Aeroplane of Jan. 29th, 1919.

The general specification of this engine is as follows:—

No. of cylinders	9
Bore	5¾ in.
Stroke	7½ in.
Overall diameter of engine	52½ in.
Normal power:—	
Mark 1, ungeared	450 h.p. at 1,800 r.p.m.
Mark 2 and 3, with reduction gear	500 h.p. at 2,000 r.p.m.
Total weight, ungeared model	662 lbs.

The geared type is made in two models, the "Mark 2," the airscrew geared down to 1,300 r.p.m., and the "Mark 3," geared for an airscrew speed of 660 r.p.m.

The engine fitted to the Bristol "Badger" is of the ungeared, or Mark 1, variety.

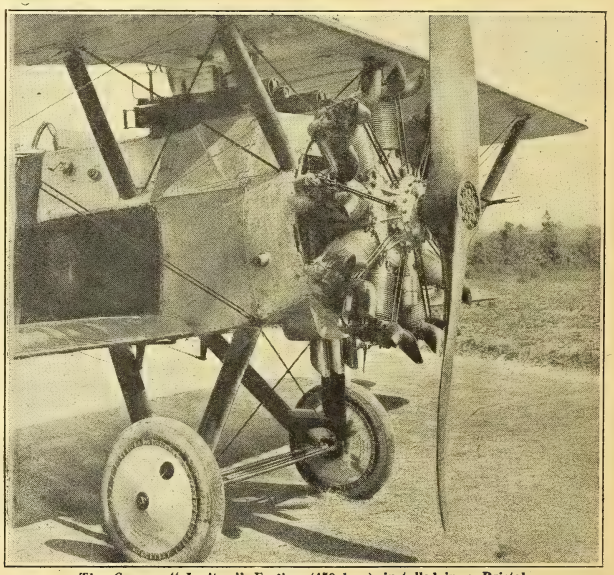
This machine was designed as a two-seater fighter, and is a very small machine, generally similar in design to the Bristol F-type scout.

Fitted with the "Jupiter" engine the results so far obtained on test are given below:—

Total weight of machine, including two passengers, military load, two machine guns, etc.	2,800 lbs.
Engine revs. on ground	1,550
Average revs. climbing at 80 m.p.h.	1,600
Revs. flying level at 7,000 feet at 137 m.p.h.	1,850
Climb—	
2,000 feet	1 min. 4 secs.
4,000 feet	2 min. 10 secs.
6,000 feet	3 min. 33 secs.
7,000 feet	4 min. 15 secs.

Illustrations showing the engine installation in the "Badger" are given herewith. Since these were taken the cowling has been somewhat modified, the machine-guns removed, and the passenger's seat has been faired in, and the test results given above will doubtless be considerably improved upon.

It is hoped that it will shortly be possible to visit the Cosmos Works at greater length and describe in detail some of the numerous interesting features of the engines produced there.



The Cosmos "Jupiter" Engine (450 h.p.) installed in a Bristol "Badger" Two-seater Fighter.



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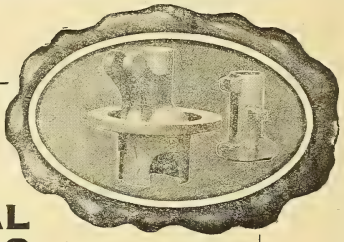
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THE WILBUR WRIGHT MEMORIAL LECTURE.

The annual lecture in memory of the late Wilbur Wright was delivered before the Royal Aeronautical Society at the Theatre of the Royal Society of Arts on Wednesday, June 18th

The lecturer was Mr. Leonard Bairstod, O.B.E., F.R.S., and his subject, "The Progress of Aviation in the War Period."

Introducing Mr. Bairstow, Major-General R. M. Ruck, the Chairman, announced that the Lord Weir had accepted the Presidency of the Royal Aeronautical Society.

THE LECTURE

It was with great pleasure that the lecturer received an invitation from the Council of the Royal Aeronautical Society to deliver the lecture of 1919 to the memory of Wilbur Wright. Most of us remember the appearance of their aeroplane in Europe about ten years ago and the revolution brought about by their method of lateral control. The effect of European flying was immediate, for the periods of flight began to extend from minutes to hours. I have particular pleasure in adding my tribute to their skill because of the scientific and painstaking way in which they approached the problem of aviation and successively removed one after another of the outstanding difficulties. Their unhurried attack on a difficult problem contrasts strongly with the present irrational worship of the immediately practical.

They were preceded by another distinguished American, Professor Langley, who, with equal patience and little reward, laid the foundations of aerodynamics on which calculations as to the possibility of flight were first made with any reasonable approach to accuracy. That Langley was correct in his estimates of weight and horse power has been shown during the war period by the flight of the man-carrying aeroplane which he designed and made. Maxim, in a remarkable effort, succeeded in producing a steam engine in which each horse-power involved a weight of only half a pound, but aviation had to wait for the petrol motor before flight was achieved.

Both Maxim's and Langley's efforts at flight came to an early end; the latter launched a pilotless aeroplane from the top of a houseboat on the Potomac river, but, probably owing to lack of stability, it dived into the water and was wrecked. Maxim endeavoured to avoid the problems of stability by making his aeroplane captive, but the bending of an axle led to disaster when the wings were taking a lift of 10,000 lbs.

It was in their progress from this point that the Wright brothers made history. Their early flight experiments were directed to the development of controls by means of which the senses of the pilot were introduced into the mechanics of the aeroplane motion. In their aeroplane it was for the first time possible to raise or lower the nose by elevator, turn to right or left by rudder and maintain an even keel by wing warping. At the present time no other controls are used or appear to be required. Of the three controls mentioned, that of wing warping for maintenance of an even keel had not previously been suggested and the ailerons of modern design are mechanical improvements and not changes of principle. The problems of inherent stability were at that time untouched in practice, although Bryan was then working out the mathematical theory which has now been adopted as the best statement and solution of the problem of the disturbed motion of an aeroplane.

I propose to skip the period 1908-1914 and to proceed to some of the relatively highly developed forms of aircraft as they existed at the outbreak of hostilities. At that time a speed of 85 to 90 m.p.h. was considered good with the possibility of climbing to a height of 10,000 feet. Military training proceeded on the hypothesis that flying for reconnaissance and photography would take place at 3,000 feet, whilst fighting in the air was not adequately provided for.

Two types of aeroplane of the early period will be referred to; both have survived on their merits to the present time, although long since past the standard required on active service. The "Avro" aeroplane has to its credit one of the earliest of the many daring and spectacular feats of our flying men, for it was in aeroplanes of this type that two aviators, now Colonel F. Briggs and Major Sippe, flew over the Zeppelin sheds at Friedrichshafen and dropped bombs on their objective.* The horse-power of the engine was 70 as contrasted with the 1,500 horse-power of the largest modern aeroplane flown. In the later periods of the war the "Avro" became the standard elementary training aeroplane and has an excellent record of good service. It appears to be peculiarly free from undesirable characteristics.

The second aeroplane which will be referred to as a good early type is the B.E.2C., which has just been declared obsolete. Much controversy has ranged round this aeroplane, perhaps more than any other, and I can imagine mixed feelings amongst members of the audience at hearing it described as a good aeroplane. Probably most of them will agree, however, that its record as a straightforward flying machine is good, and will focus their criticisms on that peculiar feature of the aeroplane which can be best described by saying that it had a strong will of its own. The development of the fighting scout has brought out very clearly the pilot's desire for an aeroplane which is wholly obedient to him even for extraordinary and dangerous manœuvres. Designers have admitted this view and have done their best to meet it. It is not difficult to see that in aerial fighting a balance must be struck between danger from enemy action and danger inherent to the aeroplane.

The B.E.2C. was deliberately designed to have a will of its own and a desire to stay right side up. It was strong and, for those days, reasonably fast, whilst fighting in the air had not begun to show prominently that its excessive stability was a defect. I want to make it quite clear at this point, that, on the other hand, instability is not a desirable characteristic in any aeroplane and certainly not for civil uses; instability leads to accidents. The B.E.2C was unpopular because it was too stable and called for considerable muscular effort in the rapidly recurring emergencies of a fight.

Scientifically and technically the B.E.2C. is one of the most interesting aeroplanes ever built. It showed conclusively that the line of argument developed mathematically by Bryan could be used to calculate the degree of stability of an aeroplane and so paved the way for the design of aeroplanes with the desired characteristics of indifference or stability as required for fighting or bombing. It showed that the will of an aeroplane is not a fortuitous characteristic, but it is one of those quantities over which the designer has a large measure of control.

The B.E.2C. had an engine of 90 h.p., carried pilot and passenger and reached a top speed of over 85 m.p.h. On these points it may be contrasted with the Bristol Fighter, which took one of the favourite places in the later phases of aerial fighting. The engine power was 275 and the top speed over 110 m.p.h. at 10,000 feet, whilst it was able to climb to nearly 20,000 feet. Using such aeroplanes our fighting pilots waited for considerable periods of time at heights of 15,000 feet ready to swoop on an enemy seen at a lower level. With the barometer at 17 inches and the thermometer showing 60 degrees of frost, prolonged effort was no small call on their physical and mental powers. Fitted with two guns firing through the airscrew and a third gun which could be trained in any direction by an observer, this aeroplane was a formidable antagonist.

The usual fighting scout was, however, a single-seater with its 2 fixed guns firing through the airscrew and trained by the motion of the aeroplane. Speeds up to 130 m.p.h. have been reached and the ceiling pushed up to 25,000 feet. This increase of speed and ceiling are accounted for chiefly by the fact that it has been found possible to instal an engine of 200 horse-power in an aeroplane weighing less than 2,000 lbs., a figure which means one horse-power for each ten pounds of load carried.

The large aeroplane, as we now know it, had no representative until the middle period of the war, when the first large type of Handley Page aeroplane began to operate from Dunkirk.† With a total weight of 11,000 lbs. and a horse-power of 550 the aeroplane will be seen to compare on weight per horse-power with the "Avro" and B.E.2C. and has a very similar top speed and ceiling. Another large aeroplane, the DH.10, compares more closely with the Bristol Fighter class and develops a high speed and ceiling.

The question arises: Is there any difference of principle involved in passing from the small aeroplane of 25 feet span to the latest Handley Page of 130 feet span?

ROUGH PREDICTION OF AEROPLANE PERFORMANCE.

(Mr. Bairstow then showed a figure consisting of a pair of curves in which the speed of an aeroplane (a) near the ground and (b) at 10,000 feet, are plotted against the weight per horse-power of the machine.)

It will be noticed that it is the ratio of horse-power to weight which is used and there is sound theoretical reason for this choice. Regarded as an empirical curve, however, it is found that the performances of the smallest and largest aeroplanes are equally well predicted. Like all generalisations it has its limitations, and a designer who has given special attention to one type will be able to give a closer prediction. On the other hand, any record of performance showing striking departure from the curve may be regarded with distrust.

MODEL TO FULL SCALE.

Not only may the curve be applied over the aeroplane range, but also to the larger models tested in a wind channel. It will shortly be possible in one of the wind channels of the National Physical Laboratory to test models so large that the lift will be 200 lbs. and on which the complex effects of the airscrew slipstream can be represented. Without waiting for this new step forward it is already clear that carefully conducted experiments on a complete model aeroplane form the best known guide to new design. I believe that I am correct in saying that both the designs of large aeroplanes by Messrs. Handley Page were specifically based on complete models; the records of the testing institutions show many other instances.

The most direct experimental evidence of the agreement between model and full scale has been provided by a comparison of the

*[What about Major Babbington, D.S.O.? And why omit the Sopwith Tabloids, the first machines to bomb Germany, and still surviving in modified form as the "Pup," "Camel," and "Snipe"? —Ed.].

†[The Dyott and the Fairey twin-engined machines were both built in 1915.—Ed.].

pressure distribution on the upper and lower wings of a biplane. The flight experiments were made at Farnborough by the Royal Aircraft Establishment and the model tests at Teddington. As three of the four surfaces agree within the limits of error of observation on the full scale the curves show no measurable scale effect.

Economics of Flight.

It has been mentioned that the speed of aeroplanes has increased from 85 m.p.h. to 130 m.p.h. in five years and some further improvement may be expected in the future. No equal addition to the speed range is probable and economy suggests a reduction. It is not possible to give a single estimate of whether it pays to fly fast in civil aviation, but for fighting it is the last reserve of superiority which is all important. In the commercial sphere, where time is money, the choice between speed and cost of running depends on how often a man's time is worth more than £10 an hour, or some such figure, and whether the aeroplane can save any of that time for him. Along the grand trunk routes railway traffic is fast, and the demand for the urgent delivery of light goods does not promise immediate support for the aeroplane carrier. For cross-country journeys, and in particular across water, saving of time by the use of aircraft becomes marked, and there appears no reason to doubt that aeronautics, like wireless telegraphy, will find its place in the world's traffic by adding to the possibilities of life and not by any considerable displacement of existing facilities. In some respects it is unfortunate that the war has produced a vigorous industry without the usual concurrent growth of civil demand and without even a clear indication of the correct road along which development should proceed.

It is to be noted that a gross weight of 1,000 lbs. can be carried by an aeroplane of modern type for an expenditure of 25 horse-power, but there is no reserve and the pilot could not climb or cope with down currents. His speed would be about 55 m.p.h. The necessary horse-power for the same load could be reduced by providing bigger wings and flying slower, and it has been pointed out by various writers that the most economical design aerodynamically requires speeds of flight below those of commercial utility.

The aerodynamic quality of the aeroplanes at the beginning of the war was not appreciably less than those of the present day, for all give performances indicated by the curve referred to above.—Ed.] Progress has followed the development of the aero-motor, which now permits the use of one horse-power for each 8 lbs. of gross weight, whereas in 1914 the same power was yoked to a load of nearly 25 lbs. The most recent of our large aeroplanes carries nearly 20 lbs. per horse-power and its performance on speed and ceiling is not greatly different to that of the "Avro" or B.E.2C. It is now accepted as a fundamental truth that the weight-carrying aeroplane cannot be the fast aeroplane, and the rate at which the horse-power curve is rising shows that the conditions become progressively worse. It needs little imagination to see that increase of top speed beyond presents limits will not easily be attained and that no great increase such as that during the war period is within the limits of reasonable expectation.

A table is given below which is instructive in the economics of aeroplane carriage. The figures are round numbers advisedly to emphasise the fundamental nature of the problem as well as to avoid any undue sense of precision in the calculation. Flight is supposed to take place at about 1,000 feet and the engine to be doing its best. The first column shows the speed of flight, the second the gross weight which can be carried per horse-power, and the third column the percentage of gross weight available for passengers and merchandise for a journey of 500 miles.

Speed of flight, m.p.h.	Gross weight, lbs. per h.p.	Percentage of gross weight available for passengers and merchandise.
60	38	45
70	35	44
80	28	41
90	21	38
100	17	33
110	13	27
120	10	20
130	8	10

It will be seen that the choice lies between a time of six hours and a useful load of 40 per cent. of the total and a time of four hours and 20 per cent. of load useful.

This disadvantageous law of speed can be modified to a small extent by design and the final result is typical of the ordinary engineering compromise. One of the changes of design contemplated involves an increase of landing speed, but until forced landings become very infrequent so that a prepared ground can always be relied upon, it is difficult to imagine any substantial increase on the usual landing speed of 40 to 50 m.p.h.

An appreciable aerodynamic advantage arises from flying high. The formula shows that the original design of an aeroplane does not fix the most economical speed, but only its airspeed. It is further fundamental theorem in aerodynamics that the resistance of an aeroplane is the same at all heights for the same indicated airspeed and as a consequence the work done and fuel consumed on a journey of say 500 miles is the same at all heights. On the other hand, the earth speed for a constant indicated airspeed increases with height in the ratio of 1.16 : 1 at 10,000 feet and 1.37 : 1 at 20,000 feet, and a saving of time results from high flying. The weight of engine would rise somewhat since the power required increases in the same ratio as the earth speed, but the modification of conclusion is not serious.

(To be continued.)

£400 INCLUDING TUITION.

Those who are desirous of owning their own aeroplane and of flying it themselves should be interested to hear that the London and Provincial Aviation Co., Ltd., are placing on the market a two-seater machine, with a 50 h.p. Gnôme engine, having a top speed of about 65 m.p.h. and a ceiling of 9,000 ft., for the sum of £400, which includes the tuition of the purchaser up to the point of taking the Royal Aero Club Certificate.

A CLAUDEL HOBSON ACHIEVEMENT.

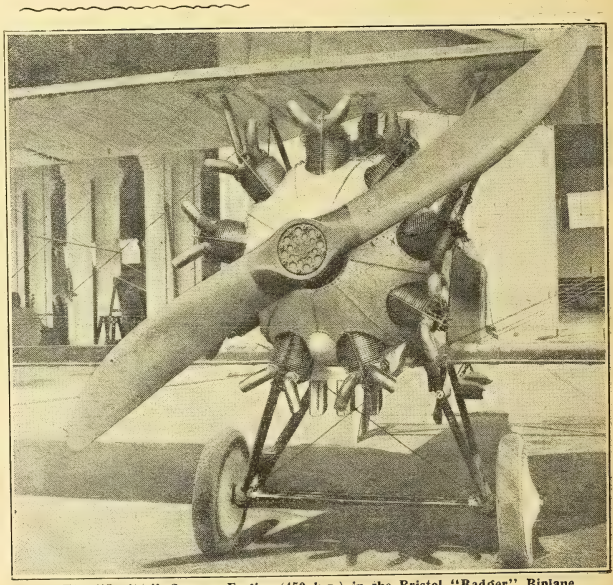
It should be noted that the Rolls-Royce engines of the Vickers "Vimy" machine upon which Capt. Alcock and Lieut. Brown crossed the Atlantic were fitted with Claudel Hobson carburetters.

The war record of Claudel Hobson carburetters is such that this demonstration of their qualities was scarcely needed.

LIGHTING AND STARTING.

The Chloride Electrical Storage Co., Ltd, of Clifton Junction, near Manchester, have just issued an illustrated price list of their "Exide" accumulators for car lighting and starting purposes.

This type of battery has been largely used by the makers of both British and American cars, and they are, therefore, suitable for replacements on cars of both nationalities



The "Jupiter" Cosmos Engine (450 h.p.) in the Bristol "Badger" Biplane.

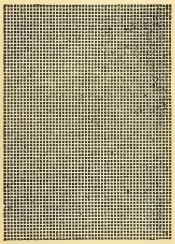
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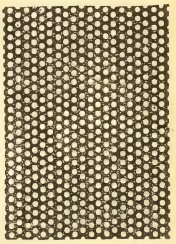
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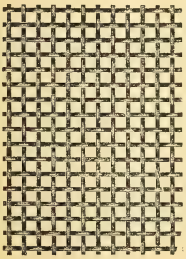
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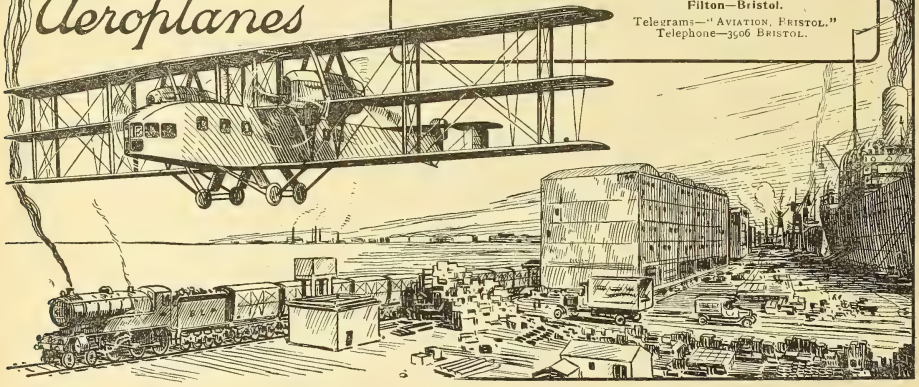
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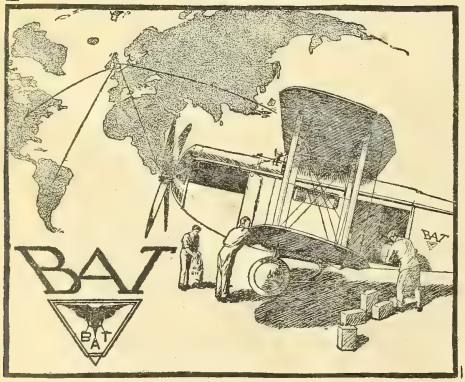
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THE AIRCRAFT TRADER

MARKET TOPICS.

PRICES ARE FOR QUANTITIES ON USUAL TERMS.

JUNE 19th, 1919.

COPPER.—Upon resumption, after the holidays, the market became much firmer, and there has been a continued improvement. A prominent feature of the market is the interest which is being shown by consumers. The increased demand has resulted in the increase in values, and if the demand continues to improve, it is more than likely that prices will continue to harden.

It is expected that the recent advance in price will affect the prices of manufactured Copper. It should, however, be pointed out that these prices are already out of all proportion to the prices of Ingot, and if an advance is made, it should be very small. There is at present a scarcity of B.S., and this metal is still advancing, offers to purchase at £86 having been declined.

The position in U.S.A. is still very obscure, there has been a fairly good demand, but there is still a lack of confidence, and there is a feeling that certain American influences are endeavouring to force the price up

COMPARATIVE PRICES.

	Per Ton. £ s. d.
To-day, June 18th	83 15 0
Last week	80 15 0
Last month	78 2 0
Average price, 1918	115 10 0

TIN.—During the past week this market has been fairly active, and prices have greatly hardened, this has been particularly noticeable since it became known that the American embargo on Tin Imports would be lifted on July 1st. It is expected that there will be a big demand from U.S.A. when this takes place.

On the other hand, it must not be forgotten that American buyers have already been busy placing orders in the East, as stated last week, and it now transpires that consumers on the Pacific Coast have been informed that there are no stocks available for them, and have been instructed to place their orders in the East.

Although a healthier tone is in evidence, and prices are advancing, there is no cause for anxiety, as the world's stocks of Tin are sufficient to meet all demands, even if the stocks here are, at present, only small.

COMPARATIVE PRICES.

	Per Ton. £ s. d.
To-day, June 18th	242 10 0
Last week	236 15 0
Last month	241 17 0
Average price, 1918	329 11 0

LEAD.—There is a lack of confidence in this market at present, this being due to the increase in Government stocks, and offers of Lead having been made at prices which are less than the official price. There are huge world stocks of Lead available, and although the prices recently quoted are quite reasonable, buyers do not show any desire to purchase quantities beyond their immediate requirements.

There is a brisk business being done in manufactured Lead, and particular attention has been paid to White Lead. It would not be surprising if the price of the latter were advanced. The price of Pig Lead to-day is £23 per ton.

STEEL.—The chief feature of this market at present is the rumour that there is a possibility of the price of coal being advanced again about 4s. 6d. per ton; the rumour has apparently been based on a statement made by Sir Auckland Geddes. If the statement is correct, then the position will be very serious, as the price of Steel will also advance approximately between 15s. and 20s. per ton.

It is a well-known fact that America is already doing a big export business with South Africa, Australia, India and other colonies, and they are doing their utmost to get the Steel trade of Great Britain.

The Steel market generally is in a very unsatisfactory condition, and there are no immediate prospects of improvements. There is still a slump in High-speed and Cast Steel, and the demand shows no signs of reviving.

TIMBER.—This market at the present time continues to show signs of firmness, and the demand continues to increase. Unfortunately, it is becoming increasingly difficult to get supplies into the country, owing to the shortage of freight. The result is that prices are beginning to advance.

Very little Mahogany has been received, and the stocks which were held are being consumed. The demand for this Timber, and also for Walnut, is very good, and the market is in a strong position.

There is very little Silver Spruce available at the present time for Aeroplane construction, and firms whose stocks are low, are likely to be in a serious position, as there is not much prospect of any shipments coming forward.

There are ample supplies of Plywood in the country, and some firms are anxious to dispose of their stocks, owing to the huge quantities which are available in various parts of the country. There does not seem to be any reason to expect a slump in the market. The demand for Plywood will certainly increase in the near future.

A circular recently has been issued by the Board of Trade dealing Plywood from the list of prohibited imports.

FABRIC.—The Aircraft Disposal Board stated at the beginning of June that they were prepared to sell their stocks of Fabric in lots of not less than 80 yards, but from the recent deal with Mr. L. J. Martin, it looks as though they have changed their minds. The particulars of the deal are as follows:—40,000,000 yards of Fabric has been purchased by Mr. Martin, the approximate total price being about £4,000,000. The price must, therefore, be between 1s. 6d. and 1s. 10d. per yard, 36 ins. wide.

If this assumption is correct, then the Ministry cannot be commended. Apparently, it is Mr. Martin's intention to sell the Fabric at prices less than those at which the Belfast Spinners can manufacture. If this is the case, then the Belfast firms will certainly have a grievance against the Ministry.

In any case, the transaction requires further explanation, as the Ministry must have paid about 3s. per yard 36 ins. wide for the Fabric, and it is understood that the price at the present time for the same Fabric would have been much higher than this figure, owing to the increased cost of raw material and labour.



THE DESIGN AND DRAWING OFFICE STAFF OF VICKERS, LTD., who worked on the Vickers "Vimy" Biplane (Rolls-Royce Engines), which won the trans-Atlantic Prize. Mr. H. S. O'Brien, Chief Draughtsman, is seen in the centre. The modesty of Mr. Pierson, the Chief Designer, accounts for his absence from the photograph.

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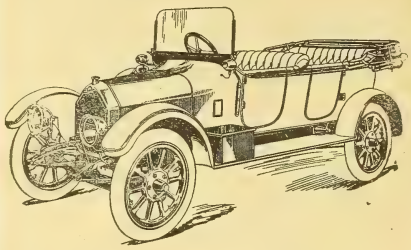
(*Signed*) CYRIL TURNER.

Mr. Turner (Bat Bantam) won the Cross Country Handicap at Hendon on Whit-Monday, doing his fastest lap at a speed of

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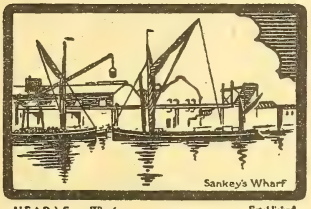
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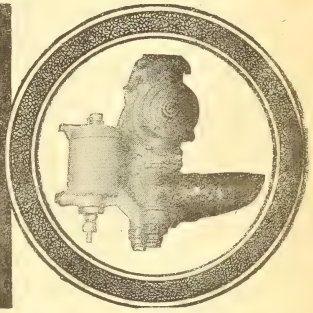
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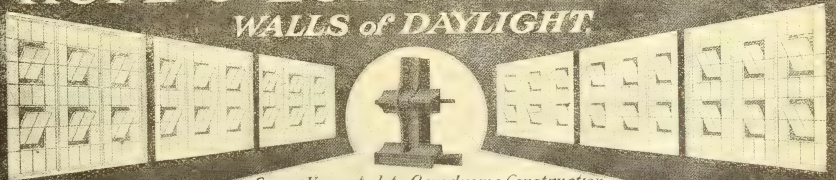
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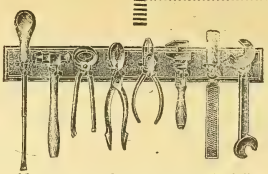
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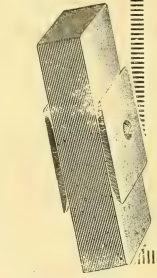
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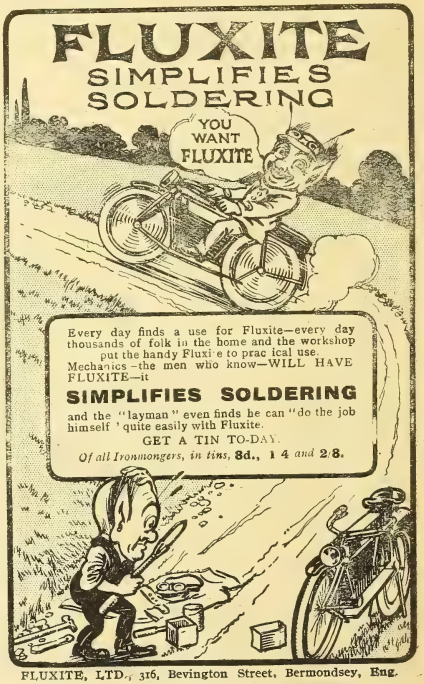
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(A SUGGESTION TO THE S.B.A.C.) By "MEDWAY."

It strikes me very forcibly that there is considerable danger of Commercial Aeronautics being made a sort of plaything of the stunt-hunting section of the Press. It is just the kind of development that would strike the enterprising journalist as making fine material for a slack season.

Now, any movement which lends itself to this sort of treatment is very liable to have its balance upset. For a time nothing is too charming to be said about it. It is destined to revolutionise the traffic and transport of the world. It is far advanced on the high road to perfection. It is portrayed in glowing colours, with the result that astute people, realising the influence of the daily Press on the public mind, see an admirable opportunity of doubtful company-promoting on a big and profitable scale.

Exaggerated Enthusiasm or Unjustifiable Pessimism.

The trouble is that a period of exaggerated enthusiasm is generally followed by a swing of the pendulum and a period of unjustifiable pessimism or else of total neglect. For the moment the latter is perhaps the more probable. Things will not come along as quickly as enthusiasts had hoped. The papers will get bored with discussing a development which does not appear to materialise to order, which will not bloom with the facility of the sweet-pea, nor rise with the rapidity of standard bread in the baking.

The consequence is that, when, so to speak, the cream has been skimmed off by a journalist who does not care to go far beneath the surface, the rest is left to go sour.

A few months ago the daily papers were nearly full of optimistic articles on the commercial uses of the aeroplane. Anybody with a vestige of knowledge was interviewed and reported at length. Even the most far-fetched and impracticable ideas were set forth in detail, giving good publicity to their inventors, but very doubtful publicity to the movement.

It will be noticed, however, that for the past few weeks the subject appears to have died out. It has been replaced for the time being by topical news relating to the Atlantic Flight. When this latter ceases to be a sensation, there is fair prospect that the whole subject of aeronautics will be regarded for the nonce as having gone stale, and will be neglected until some new and exciting development is in sight.

A Balancing Force Needed.

It seems to me that we are in need of some balancing force; something which, when optimism runs riot, will apply just a sufficiency of cold water, and, when pessimism or neglect appears imminent, will act in such a way as to maintain equilibrium and keep the subject to a reasonable extent before the eyes of the public, gradually feeding out information without overdoing the thing.

In connection with motoring, there has been formed recently what is called the Motor Legislation Committee. Its object is fairly well expressed by the title, but the method of obtaining its object is not quite so obvious. In point of fact, the method in the main amounts to organised propaganda. This means that the Committee must have a really competent staff, and must enlist the sympathy of a number of well-known men prepared to give at least a little of their time to the work with which the Committee is entrusted.

The main trouble of the motor movement at the moment is the risk of adverse legislation having the effect either of restricting the use of vehicles or of allowing the roads on which they must run to deteriorate in order to benefit the railways. The position of commercial aeronautics is different. The main need of the moment is to encourage sane and to discourage insane development. We do not want people to get an idea that if they invest their money in any commercial aerial scheme they will become millionaires in a week, neither do we want them to think that such an investment in itself qualifies them for the lunatic asylum. Again it is undesirable that people should jump to the conclusion that our whole system of commercial aeronautics is within a few inches of perfection. It would be equally unfortunate if they came to the conclusion that we have run up against bad snags over which it is impossible to steer a safe course.

A Disturbing Influence.

In my humble opinion, the Atlantic attempts up to the present have had a disturbing influence on public opinion. This should be corrected by authoritative statements pointing out how very much the Atlantic proposition differs from an ordinary commercial proposition for the running of a service mainly on an overland route. We ought also to be told by people whose words carry weight in what ways the Atlantic attempts have contributed materially to our knowledge and brought the ultimate success of commercial aviation nearer. The general public looks on anything of the kind as a demonstration of what can and what cannot be done. It wants to be made clear that experiments of this kind are rather in the nature of practical research or of pioneering than of demonstrations upon the results of which public opinion should be formed.

If people are drowned or narrowly escape drowning in an attempt to navigate the Niagara Falls, it does not follow that it is inherently unsafe to work a motor barge along a canal. This is more or less an extreme example, but the point is that we must not draw inferences from an unquestionably dangerous venture, recognised as such in informed circles, and apply our conclusions to a comparatively placid and unexciting commercial enterprise.

Organised Propaganda.

I suggest, therefore, that it would be a good thing to have, in connection with commercial aeronautics, an organisation very much on the same lines as the Motor Legislation Committee. This Committee draws its financial support from a big body of Motor Manufacturers and Traders and a big body of Motor Users. The corresponding Committee or Bureau that I have in mind

might be financed on similar lines by the joint effort of trade and using interests. The function of the body would be executive. Its activities ought, I think, to be more or less controlled by a small Committee which should meet fairly frequently and should consider the general trend of public opinion as expressed in the lay Press. Whenever this opinion showed signs of going off the rails in one direction or the other, the executive of the Bureau would be expected to organise propaganda to restore equilibrium.

This would sometimes mean the preparation and placing of articles describing the conditions under which commercial success might fairly be expected in connection with aerial ventures. It would sometimes involve the employment of literary men whose names are well known, and who can therefore get special attention from a public to which the name of the technical specialist is possibly unfamiliar. It would sometimes mean the making of arrangements in which specialists would consent to grant interviews and to discuss certain aspects of aeronautics or certain lessons that may have been learnt from recent experiments.

The Necessary Opposition.

Whenever statements appeared of a kind likely to give the public a distorted view of the real position, the executive of the Bureau would take the matter up and deal with it either by letters to the offending papers or by other means, possibly not altogether disconnected from advertising considerations.

In course of time the Bureau might very possibly come to bear a close resemblance to its prototype. There will, no doubt, be brought forward before long legislative proposals of a restrictive character. Possibly one or two unfortunate accidents will lead to suggestions which, if put into effect in law, would deal a very serious blow to progress. Anything of this kind would be carefully watched, and the necessary opposition organised in advance.

The Motor Industry and the motoring community have suffered from the first from the lack of an organisation on the lines of the one which they have now at last created. If we do not want history to repeat itself in another sphere, it seems to me that we ought to take our precautions without delay, and establish a Bureau which, by organising propaganda in the Press, on the platform and elsewhere, will gradually mould a well-informed public opinion, which will keep the whole development comparatively clear of unsavoury but successful company promotion, and equally will eliminate the risk of hostile prejudice based on ignorance of the true facts.

MR. F. H. ROYCE.

The fame of the Rolls-Royce engine, to which the trans-Atlantic flight has added further laurels, makes interesting the identity of the man responsible for its creation. Yet of all the men whom the motor movement has pushed into the limelight of prominence, it is doubtful if there be one whose personality is so unknown as Mr. F. Henry Royce, M.I.M.E., M.I.E.E., etc., to whose fertility of invention and creative genius the Rolls-Royce owes its unrivalled position in the world to-day.

Born in 1863, the son of a farmer in South Rutlandshire, he was obliged to begin work at an early age owing to the death of his father, who for a few years previous to his death had been the technical expert for a steam flour milling concern. The insight into mechanics afforded by his father's occupation gave young Royce his first incentive to engineering, which was subsequently to make his name world-famous. A few years' apprenticeship at the G.N.R. locomotive works at Peterborough, during which time he devoted himself to the study of mechanical science at the City Guild Technical College under Professors Ayrton and Perry, laid the foundation of his acquaintance with practical mechanics, which has since served him and the motor movement in such good stead.

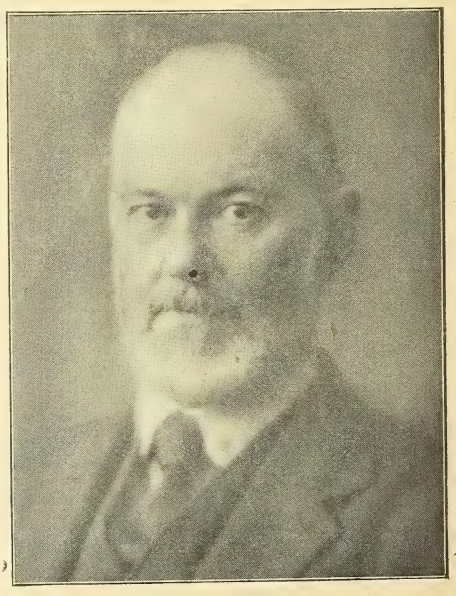
In his eighteenth year he obtained employment at Leeds as an engineering fitter, and worked long hours building and testing machines for the Royal Italian Arsenal, then being built. Before his twentieth birthday he had removed to London, and from the parent company was sent to Liverpool to be chief electrical engineer to the Lancashire Maxim and Weston Company in that city.

The firm of Royce, Limited, was started in 1884, when its founder was of age, in conjunction with Mr. Ernest A. Claremont, of Manchester. From very small beginnings, making arc lamps and dynamos, the firm subsequently branched out into electromotors and electrically driven cranes, in connection with which the name of Royce is famous to this day. The large electrically-driven Goliath cranes are perhaps the best known of Mr. Royce's productions in this line.

It was not until 1903 that he turned his attention to the motor industry, on the invitation of the late the Hon. C. S. Rolls, the outcome being the formation of the firm of Rolls-Royce. From the little 10-h.p. car which first carried the colours of Rolls-Royce, to the enormous Vickers "Vimy" aeroplane, propelled by two Rolls-Royce "Eagle" engines across the Atlantic, it has been the brain of Mr. F. H. Royce which has worked out every minute detail of development and perfection which pertains to the name of Rolls-Royce.

Nor is this renown a matter of appropriating the work of subordinates, as too frequently happens in the case of much advertised geniuses. Mr. Royce is a man who can and does handle any tool like a craftsman, but he is, moreover, equally fertile in designing improvements in tools, as every mechanic in the great works at Derby can bear witness. But more valuable still than personal handicraft is the faculty he possesses of selecting the best men to carry out his designs, to which is largely due the super-excellence of every minute detail of the Rolls-Royce engine and car.

For years Mr. Royce has enjoyed but indifferent health, in fact, his personal appearance would suggest the collegian rather than the mechanical designer whose name will be recorded in history with those of Stephenson and Watt. For the purpose of minimising the physical and mental strain of business, he has spent considerable time during the past few years in the South of France, a sojourn which has happily fitted him for the onerous work of reconstruction looming in the near future. Mr. Royce has been acclaimed by many as a genius. In his case, as in most others in which work of permanent value has been done, genius has been proved to be an infinite capacity for taking pains.



Mr. F. HENRY ROYCE, of Rolls-Royce, Ltd.

Imber Anti-fire Tanks

Messrs. Brown and Melhuish and Mr. Imber are forming a company to manufacture the Imber Anti-fire Tank, for the prevention of fires in aircraft accidents.

The Imber Anti-fire Tank is supplied to, and approved by, His Majesty's Government.

For particulars please communicate immediately with Messrs. Brown & Melhuish, 4 & 8, Park Street Works and St. Albans Place, Islington, N.

Phones: North 2800 and 1774. Wires: Bromelsar, Hibury, London.

The Imber Anti-fire Tank prevents fire in aircraft accidents.

CIVIL AERIAL TRANSPORT NOTES.

United Kingdom.

It is understood that arrangements have now been completed for an aerial pleasure service to be run at Brighton during the summer. Land machines and seaplanes will be used, and permission has been granted for the machines to use "The Ladies' Mile" at the north end of the town as a landing ground. A rental of £15 per season will be charged for this ground, and each seaplane will be charged 10s. per week.

FLYING AT HOUNSLOW.

The following cross-country flights were made during the week ending June 22nd :—

One to Brighton and return, one to Derby and return, one to Swansea and return, one to Ascot and return, one to Dunstable and return, one to Southsea and return, one to Margate and return, one flight from Hounslow to Margate, and one flight from Southampton to Margate.

On the flight to Swansea Colonel Henderson's machine left Hounslow at 3.45 p.m. and arrived at Swansea in 2 hrs. 25 min. The return journey commenced at 7.55 p.m., and ended at 10 p.m.—a distance of 360 miles, with two stops for replenishment and a complete inspection of the beach at Swansea. The whole journey occupied 6½ hours. Over 600 passengers were carried during the week at Hounslow.

PASSENGER CARRYING AT EDGWARE.

A number of passengers were carried on Saturday, Sunday, and Monday with great success by the London and Provincial Aviation Company. An Armstrong-Whitworth (160 h.p. Beardmore) machine has been erected and tested. It carries three passengers quite comfortably, and as soon as this machine has been passed by the Air Ministry it will be used for passenger service. The company are now proceeding with a new passenger-carrying machine with an 80 h.p. Le Rhône engine.

Australia.

Mr. R. Lloyd's aerial survey party have arrived at Burketown, Queensland, after a very rough journey of 2,550 miles across country from Sydney to the Gulf of Carpentaria. They located aerial landing stations and relay and fuel depots on their route, each 300 miles apart, so that a chain of landing stations from Sydney through Queensland and along the Gulf route is now completely charted except for the Darwin site which will be chosen at the end of the survey party's journey. There is to be a station at Borooloola, in the Northern Territory. An alternative interior route will be surveyed from Camooweal to the Catherine River by way of the Newcastle waters and across the heart of the Northern Territory.

Brazil.

According to "Auto Propulsao," of May 15th, the Brazilian Minister of Communications has authorised the publication of official instructions relative to inter-State and foreign aerial transport services in Brazil.

The principal points of the regulations are summed up as follows :—

The network of aerial communications will cover all the State capitals, but concessionaires may, with the permission of the Government, extend their services to other cities if it is found to be desirable on commercial or industrial grounds.

Two years will be allowed to concessionaires for organising connections between capitals.

Concessions carry no monopoly of any kind, they will cover aerial transport of passengers, mails and small parcels as soon as it is considered sufficiently safe.

The obligatory number of journeys, fares and rates are to be fixed by schedules agreed upon with the Government.

No letter or publication may be carried without proper postage stamps.

No passenger or goods service is to be started without previous licence of the Federal Government, which will regulate the conditions of the service under its own direct inspection and supervision.

Concessionaires will be obliged to admit to their workshops and upon their machines cadets of the National Flying Services.

Concessions will be granted for a period of ten years, and concessionaires must undertake to fulfil any obligations ordered by the Government in the future, without any claim to indemnity, in so far as relates to questions involving aerial dominion or the national security.

After two years the Government may order that all commanding officers, pilots and crews of aircraft engaged in such services shall be Brazilian citizens and that the aircraft employed shall be registered as Brazilian at the Inspection Department of the Marine and River Transport Department of the Ministry of Communications.

FICTITIOUS FIGURES ON FLYING.

The following letter has been received.—

Sir,—The various letters from "Ex R.N.V.R.," "Common Sense," and a "Would-be Aviator" on the above subject, do not seem to me to carry the matter much farther, and I am content to leave my figure of £2.65 per ton-mile untouched, considering that it fairly represents the cost of flight at the present day with present-day machines.

I should like, though, to point out, that this figure is a minimum cost, and that "Common Sense's" figures may easily be reached with bad management or bad luck. "Would-be Aviator's" figures for a seaplane station do not astonish me :—I know of a seaplane-carrier wherein the costs of flying came to £69 a ton-mile.

When writing my first letter I took a machine for cost purposes, roughly approximating to the Bristol Braemar, and the performance of this machine, given by "Common Sense," agrees with the actual tests that I have seen. I quite agree with him that some sort of mail case and portable boat are required, but think that 5 cwt. should suffice for these, and that the further deduction of 2 cwt. that he makes is not essential. My load of 15 cwt. with the foregoing assumptions, may then be carried.

I cannot in any way subscribe to the opinions expressed in "Commercial Aircraft Design" XIV, "Speed, its Value and its Cost," by Capt. Sayers, in so far as they advise slow flight as the correct thing to aim for. The whole object of flight is speed. Flight must always be more dangerous, uncertain and expensive than other transport simply *because* of the speed, and for this reason *only* it must have complete monopoly of fast transport (transport where speed is the main consideration).

There may be cases where aircraft have special uses, apart from speed—one can instance exploration, or reaching places inaccessible to other transport—but the main use of flying is, must be, for the quickest possible delivery of light objects.

Speed must be paid for, but, if attainable, is a priceless asset. "R varies as V^2" is a horrible rule, from the money point of view; but it is, like all Nature's laws, fair, if desperate. You cannot drive a car (regardless of cost) at more than, well, say, 100 m.p.h. on the road (even a good road). You cannot drive a ship (regardless of cost) at more than 100 m.p.h. through a sea.

You *can* drive an aeroplane—now—at 140 m.p.h. comfortably, and no speed limit—theoretically—can be seen. The speed of sound, at least, should be attainable. It is granted that special means of landing and starting will be required, but no difficulty is foreseen here, beyond the inevitable speed difficulty of expense.

Pay for it—you can have it. Pay for it—in any other transport—you fail.

I am satisfied that passenger-carrying is hopeless as a regular traffic, apart from war, and Peace Conferences. The wretched human body is heavy, and even a race of pigmies carries too much poundage to pay its way aerially.

I am also convinced that the cost of future commercial flying will be much more than my figure of £2.65 per ton mile, and anticipate that the next 50 years will see a speed of 400 miles per hour, and a rate of £100 per ton mile. This will make passenger-carrying still more impossible, but will not in any way alter the value of flight for mail transport.

It will simply alter the form of mail matter, reducing its weight and bulk to conform to the new conditions. It is quite practicable to reduce photographically the present letter weighing, say, 1 ounce to a photographic facsimile weighing not more than 1/100th of an ounce, and so keep to a reasonable postal figure of, say, 3s. 0d. for a 5,000 mile journey.

Unfortunately, such a process is not likely to be realised with the human body. Naturally, aerial mail transport must grow slowly, the load decreasing in weight as speed and cost increase. At the present moment ordinary letters, weighing, say, ½ ounce, could be carried practicably at 100 miles per hour, but I look forward to micro-photographic mail as the flying load of the future.

Fast transport will bring increased traffic with it, and the photo process herein mentioned, should take a large share of the correspondence now carried out by cable. The proposal being made to adapt flying machines to present traffic by slowing them appears to me entirely mistaken, and comparable to a utilisation of Derby winners for drawing coals. Speed is flight's great exclusive asset—let us not lose perspective, but face facts, and look ahead.

"ENGINEER OFFICER."

A SUCCESSFUL TRIAL.

Another F.5 Flying-boat, built by the Gosport Aircraft Company to the design of the Air Ministry, was successfully launched on Thursday, June 19th, afterwards being towed down to Southampton Water, where it was put through a most successful hour's trial flight by Lieut. D. V. Carnegie, A.F.C., R.A.F., together with a crew of six aboard, including Capt. S. Spreat and Mr. J. Nicholson, both of the Gosport Company.

This makes the third F.5 Flying-boat of this type, built by the Gosport Aircraft Company, which has been successfully tried and delivered to stations on the East Coast by the above officer during the last five weeks.

ATLANTIC FLIGHT

THE
ROLLS-ROYCE
ENGINES

installed in the Vickers-Vimy Biplane which crossed the Atlantic piloted by Capt. Sir John Alcock, K.B.E., D.S.C., were fitted with

K·L·G
PLUGS

ALL were available, K.L.G. were chosen.

SOLE MANUFACTURERS:

The Robinhood Engineering Works, Ltd., New'ands, Putney Vale, London, S.W.15.

Telephone: Putney 2132, 2133. Telegrams: "Kaelgee, 'Phone, London."

THE TRANS-ATLANTIC COMPETITION.

Capt. Alcock, D.S.C., and Lieut. Whitten Brown reached London from Galway on June 17th, after municipal receptions at Chester, Crewe, and Rugby. In Dublin on their way through they were entertained by the Trinity College authorities.

At Euston, where they arrived at 6.5 p.m., a procession of decorated cars with members of the Royal Aero Club, including Major-General Sir Capel Holden and Lieut.-Commander Perrin, was in waiting. The Mayor of St. Pancras (Mr. G. F. Parsons), the Town Clerk, and other members of the Borough Council were present. Major-General Swinton represented the Controller-General of Civil Aviation, and with him were Colonel S. G. Partridge and Lieut. C. P. Robinson, R.A.F. Brigadier-General R. M. Groves was present on behalf of Brigadier-General Seely, Air Ministry. Vickers, Ltd., who designed and built the machine, were represented on the platform by Sir Francis Barker, Sir Trevor Dawson, Sir Vincent Caillard, and Mr. H. J. Morris. Capt. Acland, manager of the Aviation Dept. of Vickers, Ltd., Capt. Vickers, and Mr. Pierson, from whose design the successful machine was constructed, met the flying men at Holyhead.

From Euston they were taken to the Royal Aero Club, where they were toasted and various congratulatory speeches were delivered.

On June 21st Capt. Alcock and Lieut. Brown, in obedience to the royal command, proceeded to Windsor, where the King himself invested them as Knights Commander in the Order of the British Empire. They had also the honour of being presented to H.R.H. the Prince of Wales.

THE PRESENTATION LUNCH.

The winners of the trans-Atlantic competition were entertained to lunch at the Savoy by the proprietors of the "Daily Mail" on June 20th. The guests included the most advertised people in modern commerce, and representatives of most of the leading newspapers of to-day. The health of Captain Alcock and Lieut. Brown was proposed by Mr. Thomas Marlowe, the Chairman, in a long and elaborate speech which set forth the features of the flight and the virtues of the victors in full accord with the traditions of English journalism.

Mr. Winston Churchill, Secretary of State for War and Air, honoured the occasion by presenting the prizes, which, including the "Daily Mail's" £10,000 and sundry subsidiary prizes amounted to £13,000. His speech in making the presentation was such an outstanding example of English as it should be spoken that one is obliged to print it verbatim. One acknowledges the report to the "Times."

MR. CHURCHILL'S SPEECH.

Mr. Churchill said:—

The task which has been entrusted to me is a very pleasing one and a very easy one. It is to present to these two officers who are welcomed here to-day the munificent gift for the advancement of aviation which we owe to the "Daily Mail" newspapers and to those other donors who have just been mentioned by the Chairman in his speech, and after the very excellent speech, Mr. Marlowe, which you have made, touching one after another on all the true and salient points which arise on this occasion, there are very few things which I have to say. Indeed, I can, and shall, do little more than to associate myself with all that you have said.

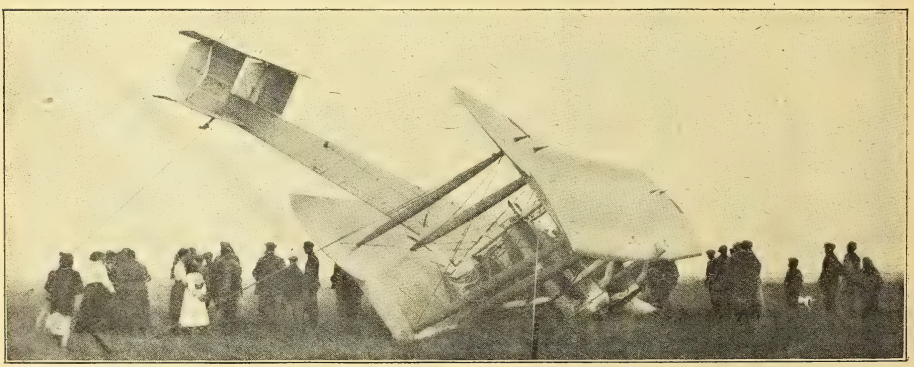
I agree with you, and I feel that everyone here agrees with you, when you have claimed that we are met together to celebrate a most wonderful and valiant achievement. It is an achievement which marks the advance of science, and, as you have pointed out, of engineering, and the increasing triumph of men over nature. But it is also an event which shows that, while we have become more powerfully equipped in all that sort of apparatus, we have also preserved as a race the audacity, the courage, the physical qualities of the old heroic bygone times. By this achievement we are able to see, we are able to assure ourselves, that our civilisation has combined the science of the 20th century with the virility and love of adventure of the knights of old. And, let me add, as you have in your own way, so effectively conveyed to us, with a modesty and courtesy worthy of ancient tradition, and probably far superior to ancient practice.

In 1492 Christopher Columbus sailed across the Atlantic and discovered America. I cannot help feeling that this afternoon we are to some extent in contact with and in relation to that event, and that when we welcome our guests—the heroes of to-day, who have come back from the other side, come to us from America in something less than 16 hours—we are in the presence of another event of something like the same order as that stupendous event which revealed to Europe and Asia the boundless glories and possibilities of the new world across the Atlantic Ocean. How different were those two voyages in all except two conditions—the peril and the pluck; otherwise the difference presents the most violent contrast that could be imagined, but the pluck and peril are of the same order. In the case of Columbus—the Ambassador is my authority—it occupied 90 days to traverse—that immense expanse of waters, and our guests to-day have come back across the ocean in less than 16 hours, but into those 16 hours were crammed the concentrated perils, which required the same great human qualities as were exhibited in that long, earlier voyage of ancient times.

And as I have said, we see from these reflections at once the advance of human powers and methods and the preservation unimpaired of the old deep primitive virtues and energies of mankind. It is more than 400 years since Columbus discovered America; it is only 10 since Blériot flew the English Channel—it is not so safe and easy as it sounds, or as is often represented, to fly the English Channel. Anyone who knows the anxieties which arise in the breast of a pilot, possibly even in the breast of a passenger, when that voyage has to be made in mist or at a very low altitude, is in a good position to judge the kind of achievement which we are gathered here to acclaim together to-day.

Think of the broad Atlantic, that terrible waste of desolate waters, tossing in tumult in repeated and almost ceaseless storms, and shrouded with an unbroken canopy of mist. Across this waste, and through this obscurity, two human beings, hurtling through the air, piercing the cloud and darkness, finding their unerring path in spite of every difficulty to their exact objective across those hundreds of miles, arriving almost on schedule time, and at every moment in this voyage liable to destruction from a drop of water in the carburetter, or a spot of oil on their plugs, or a tiny grain of dirt in their feed-pipe, or from any of the other hundred and one indirect causes which in the present state of aeronautics might drag an aeroplane to its fate.

When one considers all these factors I really do not know what we should admire the most in our guests—their audacity, their determination, their skill, their science, their Vickers-Vimy aeroplane, their Rolls-Royce engines, or their good fortune. All these were necessary, and all of them contributed to their achieve-



THE VICKERS-VIMY (ROLLS-ROYCE ENGINES) as she landed in Ireland.

We are informed by
Messrs. Vickers, Ltd.,
the Makers, that

THE WINNER OF THE ATLANTIC RACE

was constructed throughout
with "CROID" Liquid Glue.

We have supplied Messrs.
Vickers, Ltd., with many
tons of "CROID" as we have
practically all the
British Constructors.

If good enough for such a test
it should be

GOOD ENOUGH FOR YOU

(See advertisement on page 2568.)

THE IMPROVED LIQUID GLUES CO., Ltd., Gt. Hermitage Street, London, E.1.

ments, and to the event which has brought us all together here this afternoon, to cheer the victors of the first non-stop Atlantic flight. They are the victors. They are the real victors, and they are the only victors. It is no disparagement to the gallantry of Mr. Hawker. It is no disparagement to the brilliantly executed exploits of the United States Navy which, working along Service lines, have obtained results of extraordinary value from a Service point of view, apart from all other points of view. It is no disparagement to any of these gallant and skilful efforts if we say in surveying the Atlantic flight made by Alcock and Brown, "This is it!"

Mr. Marlowe has touched upon another aspect of this flight, and has spoken of its significance in drawing together all the great English-speaking communities that dwell on both sides of the Atlantic. I think here, again, we all agree with him that the significance is very real and very deep. When we study these prodigious efforts which are being made by so many to traverse the Atlantic by air, to bridge the gulf of waters, to annihilate space and time which divide these great communities, when we see these intense, repeated, stupendous efforts, made from so many quarters, can we not feel that they also symbolise the attempt to unite, not merely in the sense of eliminating distance, but the attempt to unite into one harmonious association all those great communities of English-speaking free democracies, which, combined together, working in true comprehension and perfect freedom, constitute an absolute guarantee for their own safety, and the surest promise of the future advantage and security of the world.

I think this great, varied, and distinguished company would wish me to express on their behalf almost the only point in connection with this subject to which Mr. Marlowe did not refer in his admirable address—I mean the great services rendered to aviation by Lord Northcliffe and the "Daily Mail."

That powerful factor in our modern social and political life which is usually described as the "Northcliffe Press," has in its time championed many causes, and some of them have been very excellent causes, but I venture to think there is no cause which they have more consistently championed and which has been better deserving of their support than the popularisat on and the development of the art of flying, and the gathering together of a strong public sentiment in favour of great exertions along that path. Now, I think it is very appropriate that this prize which Lord Northcliffe offered should have been won at a juncture when the news of this successful result must have fortified him and cheered him in the severe ordeal from which we have every reason to hope he is successfully emerging.

At the beginning of these few observations, I spoke of the deeds of our two guests to-day being worthy of the knights of old. But why should there only be knights of old? Why should there not be knights to-day? These two officers in the war did their duty in a perfectly straightforward manner, suffering wounds, or captivity, as so many of their comrades have done. They would be the first to say that any personal qualities that they may have displayed, or any personal risks that they may have run, are no greater than those qualities which have been displayed and the risks which have been run by scores of their comrades in the flying services in the long repeated months of peril and effort which have constituted the history of the flying services during the great war. Therefore, it is not in this sense that they would be wished to be singled out for a special honour, but in addition to all those qualities which are so admirable, and which so many of our flying officers have displayed in the course of their duty, our guests this afternoon are forever, as you have said, Mr. Marlowe, associated with a unique world-famous and joyous event. No one has ever flown the Atlantic in a single bound before, and no one will ever fly the Atlantic for the first time in a single bound again. I am very happy to be able to tell you that I have received His Majesty's gracious assent to an immediate award of the Knight Commandership of the Order of the British Empire, to both Captain Alcock and Lieut. Brown.

Now it is my duty to present to you, Captain Alcock, these three cheques—one of £10,000, one of £1,000, and one of £2,100—which constitute and which are your due for having fulfilled the conditions prescribed by those who instituted this most useful and fortunate competition.

Further Proceedings.

The announcement of the knighthoods for Captain Alcock and Mr. Brown was as much a surprise for the heroes of the day as to the others present, for neither had had any warning that this honour was to be conferred on him. Captain Alcock told the writer afterwards that Mr. Churchill had told him during lunch that he had "something for him," but that he (Captain Alcock) thought it was the A.F.C., and he confessed to being swamped at the idea of being Sir John Alcock.

In returning thanks, Captain Alcock read a brief account of the flight across the Atlantic, embodying so much as was true of the various newspaper accounts already published. Mr. Brown, when his turn came, gave an equally lucid and simple account of the flight from the navigator's point of view. Both these officers made a gallant attempt to talk down to the intelligence of their audience, and succeeded admirably. One hopes that at a later date each may be induced to give a lecture on the flight to the Royal Aeronautical Society, before which they could speak in technical terms and could give details which would be without interest to a commercial and journalistic gathering.

The American Point of View.

Mr. J. W. Davis, the American Ambassador, proposed the toast of the Chairman in a way which showed that he is a worthy successor to the former illustrious holders of his office. Extreme pressure on space forbids reporting his speech in full, but certain gems of sound common sense and wit must be recorded. As, for instance:—

"Their flight was a wonderful achievement, one the importance of which can in no respect be underrated. Where, in all the history of mankind, is there a romance to parallel this constant narrowing of the Atlantic Ocean? Columbus first set bounds to it. May I digress for a moment to protest that, when Mr. Churchill turned to me and said, 'Do you know how long it took Columbus to cross the Atlantic?' and I, after scratching my head, said, 'No, I don't, but you can make it at least 90 days.' I had no idea that he intended to underwrite his own ignorance at the expense of mine?

"Then, after Columbus had discovered that, if the winds favoured you, you could really reach something on the other side, Robert Fulton came with his steamboat and proved that the winds had nothing at all to do with it. Next, after the steamship had established communication, Cyrus Field tied the two sides of the Atlantic with cables stronger than the steel of which they were made; and hardly was the romance of Atlantic cables forgotten before men began to whisper to each other by means of the wireless.

"Now, to-day, a man sleeps one night in America and the next in Great Britain. What is it but the drying up of the Atlantic itself? I recall but one case in history where that feat was performed, but it was not a lasting feat. My recollection is that the Red Sea returned to its former habits very shortly, but this I believe to be a permanent reform. You will understand the allusion if I say that in view of the fact that the land on the other side of the Atlantic is 'drying' so fast—there is a large and increasing number of citizens there who rejoice at the shrinkage of the ocean.

"I am not one of those who believe that this is to be a mere freak in human advance and invention, but I confidently look forward to the day when the citizen of the United States will spring to his breakfast and ask whether the morning 'Daily Mail' has come in, and I shall not be surprised if he sends his servant down to see whether a little package has not come along for him by the same post.

"Others have spoken of the effects of this event upon the relationship between our countries. Three thoughts occur to me in this connection. The first thing which seems to me significant about all this enterprise is the magnificent spirit of sportsmanship in which it has been conducted. In all these efforts, by whomsoever made, nothing but the most sportsmanlike spirit has been shown—an earnest desire to be helpful one to another, with 'Hats off and may the best man win.'

"I draw great satisfaction from the thought that in some respects it has been a joint enterprise. All of us thrilled with wonder and admiration at the splendid courage with which Hawker set out to cross the trackless waste and failed by the narrowest of narrow margins. And we took some satisfaction on our side of the water in the care and scrupulous attention which were given to detail in the attempt on the part of our Navy Department. But they, too, were unable to cross the Atlantic in a single leap. Then there came a man born in England and a man born in America, attempting it together—and they won.

"I draw from that the confident assurance and conviction that in any cause and in any enterprise in which they may be united America and Great Britain are truly invincible.

"I get an impression of a constant narrowing of the gulf that divides us, a constant approach not only of our territory and of our shores but of our people, one to another, and if it were possible to compress into a single word all that we shall need for the future to continue the happy relations that now exist I should put it in one word, 'Proximity.' Believe me, the nearer we draw to each other in time and space, in thought and sentiment, and the more we know of one another, the more tolerant we shall be to each other's problems, the more earnest we shall be in each other's help."

One hopes that Mr. Davis' words may prove prophetic, and that in due course trans-Atlantic air lines may be established which will bring about a lasting alliance between the American oligarchy and the British democracy.—C. G. G.

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THE ROYAL AERO CLUB'S WELCOME.

Captain Sir John Alcock and Lieutenant Sir Arthur Brown were the guests of honour at a banquet given by the Royal Aero Club on June 23rd at the Savoy. The affair was altogether enjoyable, not only because of the auspicious occasion, but because it provided the first opportunity since the war for a gathering of all the old-timers of British aeronautics. One hopes that an opportunity for a similar meeting will occur ere long.

The Duke of Atholl, President of the Royal Aero Club, made an ideal chairman, his speeches being brief and to the point, with flashes of humour, and pervaded by a subtle patriarchal air—despite his comparative youth—such as befitted alike his position in the Kingdom of Great Britain and in the Club.

In proposing the health of the two guests, he said that prize or no prize, risk or no risk, British aviators had been determined to be the first to make flight across the Atlantic. Some had tried and failed, but they had covered themselves with honour in the attempt. Captain Alcock and Lieutenant Brown had succeeded. Future schoolboys would link their names with that of Sir Francis Drake and other British heroes of the Western main.

It had been prophesised that machines heavier than air would never fly. He himself had seen the result of official attempts to make machines broken up and scrapped because the idea was ridiculous and expensive. In the days of his youth and folly, when the Wrights were making attempts at gliding in America, he was tied to wings and let go off the side of a Highland mountain 3,000 feet hight, in the hope that he might land on the other side of the valley, to prove the theory of automatic stability. (The reference is to the gliders of Mr. J. W. Dunne, to which Lord Tullibardine, as he then was, gave every assistance.) Fortunately he was blown up hill instead of across the valley.

No one in those days had any illusions as to what the next war would be and as to whom it would be against. They felt that with the aviators would rest one of the great factors of victory, and they knew that in the future with our aviators would be, too, to a very great extent, the maintenance of peace. In conclusion he could not refrain from saying how greatly they appreciated the honour that the King has conferred upon two members of their club.

The highest honour that the Club could confer on aviators was the gold medal of the Royal Aero Club. The Committee of the Club at its last meeting, unanimously decided to confer the medal on Captain Sir John Alcock and Lieutenant Sir Arthur Brown, and he therefore handed one to each of them with their best wishes and congratulations.

Major-General Seely made a typical speech, genial to a degree, full of references to his "old friends" (whose name would appear to be legion), decorated with the finest *nouveau art* oratory, fluent as the revolutions of a Ford, and withal intentionally and genuinely funny in spots. Amid great enthusiasm he announced, with all the weight of his position as a Minister of the Crown and as a Major-General in the King's Army, that he had just heard that the Germans had signed the Peace Treaty, and remarked that no man ever had the chance of making a better speech than that.

It was unfortunate that the papers next day failed to confirm his announcement, and merely stated what the evening papers had published before the dinner, namely, that Germany had agreed to sign. One fears that General Seely's inside information in these days is no better worth backing than was his information concerning the R.F.C. in his pre-war days at the War Office. Still, he is so transparently honest, and he does really mean so well, and he is so very pleased with life, that one feels bound to forgive him for these lapses from accuracy, for which others and not he himself are to blame.

Major-General Sir F. H. Sykes, C.G.C.A., made a neat little speech recalling the work of the pioneers of the R.F.C., and came out quite strongly as a humorist. He described British Aviation as a great partnership of the Services and the Industry, in which Civil Aviation was the very Junior Partner. One hopes that his sense of humour will provide something with boiling oil in it for those of his subordinates who are hindering the development of Civil Aviation.

Captain Sexton, U.S. Navy, made an excellent speech, and was received enthusiastically. Quite frankly, and without intentional sarcasm (or, at any rate, without showing it), he remarked upon the fine reception given to the officers of the N.C. Squadron when they visited London, and promised a still bigger reception (which would be "dead easy"—to use an Americanism) to the crew of the R.34 airship when they reached America.

Perhaps Captain Sexton is more subtle than he appears to be, for one noticed that he referred to our British performance as a flight from the American Islands to the European Islands. It will be remembered that the N.C.4 flew from the mainland of America, *via* sundry islands, to the mainland of Europe.

Sir John Alcock and Sir Arthur Brown replied with the high efficiency of a German Diesel engine—maximum effect in the fewest possible explosions—and thanked the Club for their gold medals. The latter officer remarked in all sincerity, and with absolute truth, that if they had not made the flight somebody else would have done it. Which does not in the least detract from the gallantry of their effort.

Mr. Douglas Vickers, M.P. (Chairman of Vickers, Ltd.), made the excellent suggestion that we should not be satisfied with our aeroplanes till we have beaten nature. He mentioned that the "blue-throat" when migrating flies 1,600 miles from Northern Africa to Norway in a single night, and that a bird of the plover species flies non-stop from Hudson Bay to Brazil, a matter of 3,000 miles. (There, indeed, is something to beat, but one would like to know whether these records have been homologated by the Fédération Aéronautique Internationale, and what is the evidence. Furthermore, considering that the latter bird has to fly nearly all the way over "dry" country it is obviously wiser to do a non-stop run.) Mr. Vickers also stated that the " Daily Mail " prize was no concern of the firm's, being entirely the affair of the pilot and the navigator.

Mr. Claude Johnson, of Rolls-Royce, Ltd., thanked everybody for all the nice things they had said about the engines and remarked that he believed that if such plebeian things as sausages had had a place on the menu that night they would have been described as "Sausage Rolls." He reminded those present that they were dining that night with heroes and said that he was very cognisant of the fact, for he was seated between Mr. Hawker and the future Lady Brown, of whom he said that if in future anybody asked "Which Lady Brown?" one would say "Lady Atlantic Brown, of course." Personally one is not quite clear as to whether Mr. Johnson regards the future Lady Brown as a hero for daring to marry Sir Arthur, or for enduring the anxiety of being engaged to a trans-Atlantic aviator before the flight, but, anyhow, the joke went well. And one believes that the very charming lady in question will in future be known as Lady Atlantic Brown, for she has every right to be proud of the title.

Mr. Pierson, the designer of the Vickers-Vimy, replied—under pressure—with a brief speech of thanks which demonstrated that he personally is a believer in disturbing the air as little as a 100 per cent. efficient aerofoil.

One noticed that throughout the proceedings not a soul mentioned the late lamented Royal Naval Air Service, in which Sir John Alcock did all his war flying and in which he won his D.S.C. This was no doubt an entirely praiseworthy effort to be tactful on the part of the speakers, who presumably desired to spare Sir John any painful memories of his former connection with the Royal Navy, which, thanks to its inefficient co-operation with the aviators in the Mediterranean, left him alone to sink in the Ægean, very much as it left the German Fleet alone at Scapa to sink itself at its own sweet will.—C. G. G.

OTHER COMPETITORS.

The Martinsyde Biplane.

The Martinsyde aeroplane should be completely repaired during the present week. Mr. Raynham intends to attempt the Atlantic flight from Newfoundland to Brooklands on the earliest opportunity.

The Handley Page Biplane.

The Handley Page machine was tested on June 19th in a flight of a little over an hour in order that the new radiators fitted in the early part of last week might be tried adequately. It is rumoured that this aeroplane may be flown to Gibraltar instead of to England in view of Capt. Alcock's success in winning the " Daily Mail " prize.

The Boulton and Paul Entry.

It is stated from Newfoundland that Messrs. Boulton and Paul no longer intend to equip two aeroplanes for the Atlantic flight, and Major Fiske, who is representing them in Newfoundland, has been instructed to cancel all arrangements already completed.

A CENTENARY IN CROSS-ATLANTIC PASSAGES.

It is of interest to note that exactly 100 years before Sir John Alcock sighted the shores of Ireland at the termination of his cross-Atlantic flight the American brig "Savannah," fitted with auxiliary steam power, reached Ireland from America in the first journey made across the Atlantic by the aid of a steam engine. According to tradition, this vessel, when she entered territorial waters, was reported by Irish fishermen to the local S.N.O. as in distress owing to an outbreak of fire. A cutter was sent to her assistance, the commander of which was mystified and baffled by being outdistanced by a ship apparently sailing under bare poles!

A Flight Across America.

According to a report dated June 3rd the United States Army Air Service will shortly attempt a flight across the continent of North America from New York to San Francisco, with one stop on the way.

The machine used will be a Martin bomber (two Liberty engines). The total distance of the flight is 2,750 miles, which, it is expected, will be covered in two days, a stop being made overnight at North Plate, Nebraska, which is 1,520 miles from New York. The machine will carry a crew of five men, of which two will be pilots.

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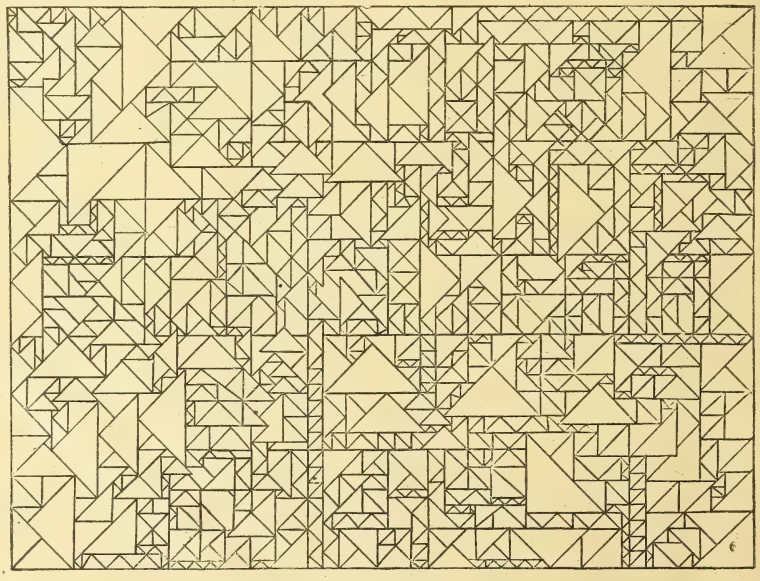
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5755 Ch. Mech. J. W. Airey (Leyburn, Yorks.) (Salonika); 558 Flt. Serjt. A. G. Alcock (Wood Green, N.) (France); 202214 Flt. Serjt. R. E. Alford (Saltash, Cornwall) (Mediterranean); 27948 Serjt.-Maj. T. H. Alford (Burnham, Dorset) (Mesopotamia); 09411 L.A.C. G. Anderson (Aberdeen) (France); 24436 Flt. Serjt. O. Anderson (Lincoln) (France); 30382 A./C.1 B. Ashley (Doncaster) (India); 17435 Ch. Mech. E. C. Aston (Birmingham) (Salonika).

18937 Cpl. W. E. Baines (Hertford) (France); 36850 Serjt. W. J. Bains (Kirkoy-in-Ashfield) (I. Force) (France); 203543 Ch. Mech. G. A. Ball (High Wycombe) (Flanders); 314099 Flt. Serjt. J. W. Barcroft (Manchester); 2127th Sqdn., Dunkirk); 8741 Serjt. Clk. J. Barlow (Bury) (Egypt); Aus. 209 Ch. Mech. F. H. Barnes (Middle Park, Vic.) (Egypt); 9409 Flt. Serjt. J. C. Bastabal (Battersea, S.W.) (France); 4638 Ch. Mech. W. O. Batchelor (Moukton, Pembroke) (Egypt); 16089 Serjt Clk B. R. Bayliss (Thornbury, Glouc.) (I. Force) (France); 16060 Cpl. W. J. Beaumont (Eaton Place, S.W.) (France); 94727 A.C.1 W. J. Beckwith (Cheapside) (France); Aus. 275 Serjt. Mech. J. M. Bennett (Windsor, Vic.) (Egypt); 6110 Ch. Mech. W. Betts (North Walsham) (Egypt); 19430 F./Clk. J. Bicknell (Coventry) (Egypt); 8715 A.C.1 C. H. Bird (Golders Green, N.) (France); 313624 Mas. Mech. L. M. Bird (Wandsworth) (I. Force) (France), 12456 Flt. Serjt. W. J. Bird (Regent's Park, N.W.) (France); 21316 Cpl. Mech. F. T. Birkinshaw (Birmingham) (Egypt); 240363 Cpl. Clk. S. E. Birt (Lydney, Glouc.) (I. Force) (France), 249562 L.A.C. actg. Cpl. W. A. Bishop (Driffield) (France); 18630 Ch. Mech. V. H. Blackman (Acton, W.) (France); 18372 Flt. Serjt. H. F. Bond (Bermondsey, S.E.) (France); 13567 Cpl. (actg. Serjt.) E. B. Boucher (Twickenham) (France); 64710 L.A.C. (actg. Cpl.) P. A. Bovey (Plymouth, S.E.) (France); 203501 Driver (Bedford) (France); 38148 Serjt. H. C. Bowley (Dollis Hill, N.W.) (France), 404072 A.M.1 H. Bowyer (Sandbach, Cheshire) (Egypt); 3910 Serjt Mech. F. Bradshaw (Manchester) (Egypt); 15328 Cpl. Clk. F. Brindley (Offerton, Stockport) (France); 201192 A.M.T. J. Brown (Canterbury) (France); 11628 Flt. Serjt. J. H. Brown (Thornhill, Dumfries) (France); 2527 Flt. Serjt. J. Bryson (Portsmouth) (France); 8438 Flt. Serjt. C. C. Burchett (Battersea, S.W.) (France); 19755 A.C.1 R. H. Butler (Leicester) (France); 203387 Serjt. Mech. G. J. Bysouth (Kennington) (Dunkirk).

3804 Serjt.-Maj. J. F. Camfield (Westminster, S.W.) (France.); 7378 Flt. Serjt. W. Canna (Hull) (France); 4659 Flt. Serjt F. J. Carrington (Ipswich) (France); 20131 Ch. Mech. L. G. Castle (Sutton, Surrey) (Egypt); Aus. 281 Serjt. Mech. A. E. Chadwick (South Yarra, Vic.) (Egypt); 1695 Cpl. Mech. J. Charlcroft (Pulborough) (I. Force) (France); 403666 Flt. Clk. W. Chewter (Newbury) (I. Force) (France); 13318 Cpl. E. T. Clark (Bedminster) (France); 19886 Cpl. Clk. H. Clark (Hull) (I. Force) (France); 8259 L.A.C. C. Colsden (Portsmouth) (France); 16320 Flt. Serjt. T. Collins (Manor Park, E.) (France); 659 Serjt. (actg. Flt. Serjt.) C. H. Condon (Twickenham) (France); 5386 actg. Cpl. J. A. Cooper (Pendleton, Manchester) (France); 217248 Serjt. F. S. Cornish (Stoke Newington, N.) (France); 223106 Serjt. F. Couchman (Lenham) (Maidstone); 17603 A.C.1 J. W. Coultas (Scarborough) (France); 75913 A.M.3 S. Coulthurst (Hackney, N.E.) (I. Force) (France); 50819 Cpl. C. Cowden (Dromore, Co. Down) (France); 3068 Ch. Mech. A. Cox (Bletchley Park, Bucks.) (Egypt); 733 Serjt.-Maj. S. C. Crawford (France); 3086 Ch. Mech. A. E. Crisp, D.S.M. (Maidstone) (Mediterranean); 19604 L.A.C. V. Crow (Worcester) (France); 16177 Serjt. (actg. Flt. Serjt.) A. W. Culver (Putney, S.W.) (France); 200404 Serjt. Mech. J. A. H. Culverwell (Notting Hill, W.) (I. Force) (France); 50048 Serjt. Mech. H. A. Curran (Portsmouth) (France); 1457 Cpl. Mech. H. W. Cutler (Erdington) (Mesopotamia).

3212 Ch. Mech. G. Darcy (Regent's Park, N.W.) (Egypt); 13097 Flt. Serjt. E. A. Davey (Osterley Park) (France); 20475 Flt. Serjt. H. Dawson (Greenhithe, Kent) (France); 16766 Flt. Serjt. H. Deadman (Fulham, S.W.) (France); 12471 A.C.1 A. E. Dennis (Upper Tooting, S.W.) (France); 21694 Flt. Serjt. J. Devonald (Italy); 266715 A.C.1 C. J. Dickenson (Derby) (France); 403616 Ch. Mech. F. E. Dilley (Glasgow) (Egypt); 19705 Flt. Serjt. R. Dolding (Basingstoke) (France); 5622 Cpl. (actg. Serjt.) J. B. Donaldson (Sale) (France); 3890 Serjt.-Maj. C. E. Downie (Glasgow) (France); 17254 Cpl. (actg. Serjt.) E. A. Downs (Catford, S.E.) (France); 14674 Serjt. (Brighton) (France).

3630 Ch. Mech. A. C. Eagers (Sheffield) (Egypt); 1570 Ch. Mas. Mech. W. W. Earle (Guildford) (Egypt); 26638 L.A.C. H. C. Eaton (Prescott) (France); 34165 Serjt. Clk. J. Elliott (Yeovil) (France); 8422 Serjt.-Maj. A. C. Emery (Gosport, Hants) (France); 203683 L.A.C. H. England (Fulham) (Dunkirk); 405749 Ch. Mech. C. E. Eveleigh (Weymouth) (Egypt); 6030 Cpl. C. F. Eyden (Sparkbrook) (France).

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14170 Ch. Mech. G. Gardner (Warwick) (Mesopotamia); 30313 Flt. Serjt. C. Gibson (Leeds) (France); 12111 Flt. Serjt. J. H. Gill (Italy); 637 Flt. Serjt. J. Goldsmith (Brighton) (France); 1472 Ch. Mech. J. Grant (Inverness) (Egypt); 13565 L.A.C. R. W. Gregory (Wembley Hill, Middx.) (France); 28118 Flt. Serjt. S. Gregory (Bolton) (France); 402561 Cpl. (actg. Serjt.) A. Griffith (Landport) (France).

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2511 Cpl. H. H. Humfrey (Forest Gate, E.) (France).

12408 Flt. Serjt. S. F. Isaac (Maidenhead) (France); 13474 Flt. Serjt. W. Ivatts (Italy).

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34739 Cpl. G. Kelsey (Streatham) (France); 32557 Serjt J. Kenyon (Duttinfield) (France); 407037 Flt Serjt F. King (Bournemouth) (France); 28822 Serjt. T. Kingsbury (Harringay) (India).

565 Ch. Mech. J. J. Lake (Upper Tooting, S.W.) (Egypt); 403695 Ch. Mech. A. J. Lambert (Bromley, Kent) (Egypt), 21034 Cpl C. H. Lane (Thornton Heath) (France), 3491 F./Clk. W. Lansdowne 'Tavistock, Devon (I. Force) (France); 44240 actg. Cpl. H. L. Layton Holloway, N.) (France); 509 Flt. Serjt. C. E. Lee (Dover) (France); 12129 Flt. Serjt. W. S. Lee (Italy); 37113 Serjt (actg. Flt. Serjt.) E. Levy (Stamford Hill, N.) (France); 4572 Serjt.-Maj. F. Lewis (Cranford) (France); 4172 Serjt. Mech. J. N. E. Lewis (Castleford) (Mesopotamia); 6068 Flt. Serjt. R. Lewis (Bayswater, W.) (France); 24227 Serjt. J. K. Longstaff (Woodhall Spa) (France).

64726 L.A.C. J. W. Maclure (Hillingdon) (France); 78635 Serjt-Maj. N. McCormick (Drumcondra) (France); 18511 Flt Serjt D. McCutcheon (Riccarton) (France); Mas Clk T. McDonald (Hqrs, 64th Naval Wing) (Mediterranean), 87095 Serjt.-Maj. I. R. Macfarlane (Edinburgh) (I. Force) (France); 33433 Ch. Mech. W. C. Mace (Westminster) (Egypt); 17283 Cpl. Mech. J. Mackay (Invergordon) (I. Force) (France); 16249 Serjt. Mech. W. H. Magie (Ilford) (France); 4110 Clk. (actg. Cpl. Clk. A. March (Lewisham, S.E.) (Salonika); 3790 Serjt. T. McSwiney (Cricklewood) (France); 21623 actg Cpl W. Margerison (Sheffield) (France); 34334 Serjt.-Maj. J. Marshall (Manchester) (France), 175 Serjt.-Maj. C. E. Martin (Peckham, S.E.) (France); 15300 Serjt. C. S. Mason (Hull) (France); 38699 Serjt T. Mason (Manchester Hill) (France); 7028 Flt Serjt. A. Maxwell (Ealing, W.) (France); 405302 Serjt.-Maj. W. R. Maxwell (Sidney Meres, Nova Scotia) (France); 6132 Serjt.-Maj. L. A. May (Cirencester) (France); 4736 Flt. Serjt. N. H. May (Par, Cornwall) (France); 9051 Flt. Serjt. A. J. Meredith (Saltburn-by-Sea) (France); 50217 A.C.1 A. Metson (Hailsworth, Essex) (France); 1511 Flt. Serjt. H. Miller (Barnwood) (India); 16812 Cpl H. Miller (Dundee) (France); 6057 Flt Serjt G. Monery (Crouch Hill, N.) (France); 21270 Serjt.-Maj. J. R. Moore (High Wycombe) (France); 2216 S.M.1 L. R. Moore (Paris); 403422 Serjt Clk A. E. G. Morgan (Abergavenny) (Egypt); 14571 Cpl. L. Morgan (Westminster, S.W.) (France); 20029 Mas. Mech. H. Morris (Redditch) (France); 16049 Flt. Serjt. J. A. Morton (Balloch, Dumbarton) (France); 2161 Flt. Serjt. A. Mottershead (Macclesfield) (France); 21681 T. W. Murgatroyd (Leeds) (France).

9858 Serjt. Mech. Naylor (Beckheaton, Yorks.) (Egypt); 7305 L.A.C. C. B. R. Nelson (Silvertown, E.) (France); 10634 Flt Serjt. W. Newall (Leeds) (France); 31491 F./Clk. J. Newcomb (Newcastle-on-Tyne) (Egypt); 16067 Serjt.-Maj. I. H. Newholm (Plaistow, E.) (France); 11685 Serjt.-Maj. H. F. C. Nicholson (Woodside, S.E.) (France).

403436 Serjt Clk. D. C. Oliver (Reigate) (Egypt); 2079 Flt. Serjt. C. Ollis (Birmingham) (France); 203187 Serjt. C. Osborne (Hendon, N.W.) (France); 212406 Ch. Mech. O. Ottley (Leytonstone) (France).

10445 Serjt A. G. Page (Italy); 59628 A.M.2 F. H. Parkes (Wolverhampton) (France); 6331 actg. Cpl C. Parry (Hereford) (France); 135523 Clk J. D. Parry (Aberystwyth) (I. Force) (France); 4206 Flt Serjt. F. H. Patterson (Preston) (France); 4638 Serjt.-Maj. J. W. Pearce (Aberlee, Kent) (France); 38037 A.C.1 (actg. Cpl.) A. W. Pegg (Thornton Heath) (France); 253828 A.C.2 F. R. Pearce (X Balloon Sec.) (Egypt); 202174 Serjt.-Maj. H. A. Penfold (Vendome); 12030 Serjt (actg. Flt. Serjt.) J. A. Perfitt (Harlestone) (France); 11012 Ch. Mec. W. Perry (Clapham Common) (Mesopotamia) 7270 L.A.C. W. Peters (Farringdon, nr. Alton) (France); 10625 Serjt. A. S. Philipson (Italy); 202349 Cpl. Mech. R. W. Pierce (Paddington, W.) (France); 3634 Serjt.-Maj. W. Plaice (Burnley) (France); 210222 Ch. Mech. H. Postill (Bridlington) (Flanders), 37036 Serjt Mech. G. C. Powell (N. Russia); 202280 Flt. Serjt. G. H. Preece (Isleworth) (France); 27091 A.C.1 C. Preston (Leeds) (France); 6870 Flt. Serjt A. Pretty (Nottingham) (France); 203523 Flt. Serjt. W. C. Purslow (St. Helens, Lancs.) (France).

31619 Serjt.-Maj. I. J. W. Ransom (Kensington, W.) (France); 16324 F./Clk W. R. Rayner (Barnsbury, N.) (Egypt); 1075 A.C. (actg. Serjt.) A. E. Reason (Easton Hastings, Herts.) (France); 4098 Flt Serjt W. G. Reason (Reading) (France); 17241 Flt Serjt W. Reddall (Ealing, W.) (France); 26504 Serjt.-Mech. J. Redding (I. Force) (France); 20443 Ch. Mech. J. R. Reed (Brockley, S.W.) (Egypt); 1365 Serjt. Mech. D. Rhind (Buckie, Peebleshire) (Egypt); 4431 Serjt.-Maj. H. F. Rice (Pendlebury, Lancs.) (France), 7615 L.A.C. (actg. Cpl.) W. G. Richards (Hammersmith) (France); 10890 Flt Serjt W. Richards (Brixton, S.W.) (France); 4-658 L.A.C. W. M. Richards (Maida Vale, W.) (France); 22412 Flt. Serjt. W. H. Richards (Willesden Green) (France); 9781 Flt Serjt J. P. Riding (Manchester) (France); 124669 Serjt C. J. Roberts (Can. For. Corps) (France); 60402 Cpl E. Roberts (Bethesda) (France); 215808 Serjt.-Maj. T. Roberts (Llandudno) (France); Aus./108 Ch. Mas. Mech S. R. Robertson (South Yarra, Vic.) (Egypt); 5707 Serjt Maj. F. Robins (Yeovil) (France), 8038 Serjt F. Robinson (Keighley) (France); Aus./236 Cpl. Mech. G. D. Rogers (Glanville, S. Aus.) (Egypt); Aus./124 F./Clk. J. H. Rogers (Hampstead, N.W.) (Egypt); 208162 A./M.1/R L. Rollings

(H.M.S. "Celandine") (Mediterranean); 933 Flt. Serjt. F. C. Root (Earlsfield, S.W.) (France); 10097 Flt. Serjt. C. A. E. Rose (Cricklewood, N.) (France); 15766 Serjt.-Maj. F. W. Rudolph (Durban, S. Afr.) (France); 28316 Cpl. T. Rumsby (Dorking) (France), 4207 Serjt. P. C. Rumsey (Maidstone) (France); 15935 Flt. Serjt. F. Russell (Ilford) (France).

20070 Serjt. H. R. Salmon (West Dulwich) (I. Force) (France); 20709 Flt. Serjt. H. R. Salmon (Hove, Sussex) (Mediterranean); 2279 Serjt.-Maj. I. J. Salmons (Towcester, Northants) (France); 24093 Serjt.-Maj. G. H. Savage (S. Kensington, W.) (France); 24108 L.A.C. C. Sellar (Brixton, S.W.) (France); 1184 Flt. Serjt. A. Scott (Montrose) (France); 20411 Serjt. (actg. Flt. Serjt.) K. G. Sharrock (Gathurst) (France); 140244 F./Clk. D. Shaw (Glasgow) (Flanders); 107904 Cpl. Clk. F. K. Shaw (Liscard, Cheshire) (Egypt); 3032 Ch. Mech. W. Shaw (Earlstown, Lancs.) (Egypt); 25631 Cpl. H. S. Shears (E. Dulwich, S.E.) (France); 4506 Cpl. F. C. Shepherd (Paris); 216 S./M. 2 R. T. Short (India); 20141 10 Ch. Mech. F. Shrubshall (Newham, nr. Sittingbourne) (France); 2676 L.A.C. L. Sills (Chatham) (France); Aus/11 Cpl. (actg. Flt. Serjt.) J. McK. Sloss (Aust. F. Corps) (Mesopotamia); 57614 actg. Serjt. A. W. Smith (Sevenoaks) (Newhaven); 201594 Serjt.-Maj. A. Smith (Nottingham) (France); 31187 Ch. Mas. Mech. P. Smyth (Galashiels) (I. Force) (France), 31931 Serjt. Mech. H. Snook (Ladywood) (Mesopotamia); 61700 L.A.C. H. Sonner (Commercial Road, E.) (France); 109834 Cpl. Mech. T. A. Sparey (Holmwood, Surrey) (Egypt); 29194 Cpl. H. Speck (Paris); 408782 Flt. Serjt. W. H. Stewart (Dorchester) (Mesopotamia); 2048 Serjt.-Maj. F. Stone (Boscombe) (France); 23752 F./Clk. W. E. Sullivan (Lee, S.E.) (Egypt); 22904 Cpl. Mech. D. G. Surridge (Stubbington, Hants) (I. Force) (France); 29068 Ch. Mech. G. W. Sutcliffe (Bayswater, W.) (I. Force) (France); 204885 Cpl W. Swain (Birmingham) (France).

19353 F./Clk. W. O. Talbot (Bournemouth) (Egypt); 5189 Ch. Mech. H. T. Tame (Birmingham) (France); 18537 Cpl. J. Tannahill (Glasgow) (France); 64004 Flt. Serjt. C. E. Tapper (Chichester) (France); 8223 Serjt. J. D. Tassell (France); 12286 Flt. Serjt. K. F. Taylor (Nottingham) (France); 202261 Serjt. F. J. Terry (Chertsey) (Flanders); 13343 Serjt.-Maj. W. Thaw (Manchester) (France); 6912 Serjt. W. A. Theobald (Felixstowe) (France); 2167 Flt. Serjt. J. B. Thomas (Tonypandy) (France); 13566 L.A.C. F. W. B. Thwaites (Southfields) (France); 10673 A.C. 1 S. A. Tickner (Tooting, S.W.) (France); 34277 Cpl. Mech. C. Tingley (Bosham, Sussex) (Egypt); 18293 Serjt. W. J. Torbison (Glasgow) (France), 24568 Flt. Serjt. W. A. Tracey (N.S. Wales) (France); 37784 F./Clk. A. C. W. Trotman (London, N.) (Mesopotamia); 19989 Cpl. (actg. Serjt.) A. W. Trotter (Ilford, E.) (France); 16676 L.A.C. N. Truckle (Amesbury) (France); 6015 Mas. Mech. W. Turner (Jarrow) (Egypt).

37362 Cpl. T. Venables (X Balloon Sec.) (Egypt); 210174 Serjt. Mech. W. E. Veness (Coleshill, Bucks.) (Flanders); 203427 Mas Clk. G. Volk (Durban) (I. Force) (France); 66606 Cpl. W. A. Voller (Epsom) (France).

64710 L.A.C. A. Walker (Greenock) (France); 214787 Clk. 1 A. T. Walker (Shepherd's Bush) (Mediterranean); 41559 Cpl. Mech. J. N. Walker (Ashton-on-Ribble) (I. Force) (France); 9419 Pte. 1 G. A. Ward (S. Tottenham) (France); 9441 Serjt. J. H. Warley (Middlesbrough) (France); 203447 Flt. Serjt. C. E. Wash (Fishguard); 4132 Ch. Mech. J. Watmough (Ingrow) (France); 32233 L.A.C. J. W. Watts (Nottingham) (France); 46615 Cpl. A. B. Wells (Balham, S.W.) (France); 340 Serjt.-Maj. F. C. Wenham (Kingston-on-Thames) (France); 879 Flt. Serjt. F. C. White (Brighton) (France); 26718 Cpl. (actg. Serjt.) P. A. White (Hanwell, W.) (France); 3787 Serjt.-Maj. C. Whitehead (Bury) (France); 26907 Serjt.-Maj. A. Whitley (Hale, Nottingham) (France); 9408 Flt. Serjt. A. Wigglesworth (Farsley Bridge, Leeds) (France); 210700 Ch. Mech. R. Wilkinson (Blackpool) (Mediterranean); 27840 Serjt. Mech. A. Williams (Talycafn, Denbighshire) (Egypt); 5806 Serjt. C. Williams (Aldershot) (France); 6366 L.A.C. T. Williams (Portsdown) (France); 4683 Serjt. Mech. T. Wilson (Broxburn) (I. Force) (France); 211219 Serjt. W. Wilson (Glasgow) (Flanders); 17388 Cpl. Mech. R. Worsfold (Peckham, S.E.) (France); 10925 Flt. Serjt. F. E. Wright (Woodsetton) (France).

17471 Cpl. Mech. J. T. Yelling (Radstock, Bath) (I. Force) (France); 5809 A.M. 3 (actg. Cpl.) W. Youde (Ulverston) (France); 3686 Mas. Mech. W. Young (Middlesbrough) (France).

65932 Serjt.-Maj. J. A. Zell (Pimlico, S.W.) (France)

Mentioned in Dispatches.

The following officers and other ranks of the Royal Air Force have been mentioned in Dispatches and Reports received in the Air Ministry for valuable services rendered during the war:—

Capt. W. R. D. Acland (Coast Patrol); Lt. K. F. Alford (Coast Patrol); Maj. J. W. K. Allsop (I. Force) (France); Sec. Lt. W. Anderson (Coast Patrol); Capt. J. W. J. Ashton (Vendome) (Paris).

Lt. G. G. Baird (France); Lt. M. R. Banks (Coast Patrol); Maj. the Hon. M. Baring, O.B.E. (I. Force) (France), Sec. Lt. (Hon. Lt.) A. M. Barron, M.C. (France); Lt. G. Baltazzi (Egypt); Capt. (actg. Maj.) E. H. Bell (Lond. Y.) (I. Force) (France), Maj. V. D. Bell, O.B.E. (France); Lt. G. L. Bennet (India); Lt. J. H. Bentham (Coast Patrol); Chaplain Rev. R. S. B. Berry (attd. I. Force) (France); Capt. J. R. Blunt (Mediterranean); Lt. W. A. Bouette (R. Welsh Fus.) (attd. Paris); Sec. Lt. (Hon. Lt.) W. Bottrill (Can. Forces) (I. Force) (France); Lt.-Col. F. W. Bowhill, D.S.O. (Mediterranean); Lt. (actg. Capt.) A. W. Brittain, M.B.E. (France); Lt. S. B. Bradley (I. Force) (France); Lt. R. P. Brailli (I. Force) (France); Sec. Lt. A. J. Brister (Coast Patrol); Sec. Lt. C. W. Brown (I. Force) (France); Lt. G. H. Brown (I. Force) (France); Lt. W. H. Brown (Le Bourget); Maj. W. R. Bruce (India); Maj. C. E. Bryant, D.S.O. (France); Capt. the Rev. P. K. Butler, C.F. (I. Force) (France); Capt. L. A. K. Butt (France).

Sec. Lt. D. E. Cameron (France); Maj. G. V. Carey (France); Lt. T. J. Carroll (I. Force) (France); Sec. Lt. A. E. Case (I. Force) (France); Sec. Lt. (actg. Capt.) L. J. Chandler (Coast Patrol); Lt. O. W. Clapp (Egypt); Capt. H. H. Clarke (Lord Kegt.) (Coast Patrol); Maj. S. M. Clevcrley (I. Force) (France); Lt. (actg. Capt.) E. McK. Cockell (I. Force) (France); Sec. Lt. S. F. Cole (Coast Patrol); Lt. C. H. Cooper (Coast Patrol); Sec. Lt. E. A. Copwell (Coast Patrol); Lt. E. O. Cudmore (France); Lt. the Hon. R. Cunliffe (Coast Patrol).

Capt. R. E. Dagnall (I. Force) (France); Maj. S. L. Dashwood, M.B.E. (France); Sec. Lt. D. W. Davies (Flanders); Sec. Lt. G. J. Davies (Flanders); Capt. F. J. Dean (Coast Patrol); Capt. D. G. Donald (Coast Patrol); Capt. C. N. Downes (Coast Patrol).

Sec. Lt. F. T. Eades (Coast Patrol); Lt. H. Edge (France); Lt. G. H. Elliott (Coast Patrol); Lt. W. C. England (Mediterranean); Maj. (Hon. Lt.-Col.) F. H. L. Errington, C.B. (I. Force) (France).

Lt. M. E. Faithfull (Coast Patrol); Lt. F. Fenwick (Coast Patrol); Sec. Lt. (actg. Capt.) D. G. Fleming (Coast Patrol); Lt. (actg. Capt.) R. M. Foster, D.F.C. (France); Capt. F. M. Fox (Coast Patrol); Sec. Lt. J. W. Fry (I. Force) (France); Sec. Lt. D. J. Fryer (France); Sec. Lt. D. B. C. Fulton (Ægean).

Capt. H. Gardner-Hill, R.A.M.C. (I. Force) (France); Lt. F. F. Garraway (Coast Patrol); Lt. F. A. D. Gauntlett (Coast Patrol); Lt. (actg. Capt.) J. S. Giffard (France); Lt. H. H. Gillingham (A.S.C., M.T.) (Coast Patrol); Sec. Lt. D. C. Girardot (Coast Patrol); Lt. (actg. Capt.) J. McG. Glen, M.C. (R. Scots) (Egypt); Lt. B. W. Godfrey (Flanders); Sec. Lt. P. Goldschmidt, M.R.E. (French Army, attd. R.A.F.) (Paris); Capt. (actg. Maj.) A. Goodfellow (Coast Patrol); Lt. V. D. Grant (Coast Patrol); Sec. Lt. C. S. Gray (Ægean); Capt. (actg. Maj.) B. F. P. Gregg, D.S.O. (Yorks R.) (Flanders)

Lt. C. S. W. Hall (Coast Patrol); Capt. D. S. W. Hambly (Middlx V.R.C.) (Flanders); Lt. M. N. Hancocks (Flanders); Lt. F. L. Harding (France); Lt. J. K. Hardy (Mediterranean); Lt. G. R. Hake (Vendome) (Paris); Capt. S. S. Hatheld (Coast Patrol); Lt. N. B. Harris, M.M. (I. Force) (France), Lt. (actg. Capt.) A. A. N. Haywood (Coast Patrol); Maj. J. D. Henry, D.S.O. (Aust. Engrs.) (Egypt); Lt. B. A. Hewett (Flanders); Maj. E. J. Holdsoll (Mediterranean); Sec. Lt. G. B. Holford (I. Force) (France); Maj. P. L. Holmes, D.S.C. (Mediterranean); Lt. R. E. Horton (deceased) (Coast Patrol); Capt. J. F. Horsey (Coast Patrol); Lt (actg. Maj.) P. C. Hoyland, M.B.E. (France); Lt. C. E. Hughes (Som. L.I.) (Mediterranean); Lt.-Col. (actg. Col.) R. C. S. Hunt (Coast Patrol); Lt. P. H. Hunter (Coast Patrol); Lt. (actg. Capt.) F. Hyde, M.C. (Coast Patrol).

Capt. L. E. Innes-Baillie (R.M.L.I.) (Paris).

Capt. E. Jarman, D.S.C. (Coast Patrol); Sec. Lt. G. M. Jcffrey (France); Sec. Lt. (actg. Capt.) J. W. Jean, D.S.M. (I. Force) (France); Lt. C. H. Jenkinson (France); Maj. E. H. Johnston, O.B.E. (France); Lt. (actg Capt.) H. G. Jones (Egypt).

Lt. V. Kennedy (I. Force) (France); Sec. Lt. C. F. King (France); Sec. Lt. A. J. Kurn (Coast Patrol).

Lt. C. W. Lambert (Coast Patrol); Sec. Lt. (actg Lt.) G. Lansdowne (Coast Patrol); Maj. (Hon. Col.) Sir W. R. Lawrence, Bt., G.C.I.E., G.C.V.O., C.B. (I. Force) (France); Capt. O. C. Le Boutillier (Flanders); Sec. Lt. (actg. Lt.) W. J. Ley (I. Force) (France), Lt. (actg. Capt.) A. Lindley (I. Force) (France); Maj. F. J. Linnell (Coast Patrol); Maj. T. V. Lister (Coast Patrol); Lt. J. Lorimer (Can. Inf.) (I. Force) (France); Capt. J. L. Luntley (I. Force) (France); Sec. Lt. J. B. Lynch (Ægean); Capt. (actg. Maj.) M. Lyon (Mediterranean).

Sec. Lt. J. P. McClelland (France); Sec. Lt. A. K. McGill (Coast Patrol); Lt. (actg. Capt.) J. McLaren (S.A. Inf.) (Coast Patrol); Capt. T. D. McLeish (Mediterranean); Sec. Lt. W. A. McLeod (Coast Patrol); Maj. C. S. MacNab (I. Force) (France); Sec. Lt. H. L. Marshall (Coast Patrol); Capt. A. B. Martin (France); Col. (actg. Brig.-Gen.) E. D. Masterman, C.B.E., A.F.C. (Coast Patrol); Lt. (actg. Capt.) W. J. Mathews (Tanks Corps) (Coast Patrol); Capt. T. G. Mellanby (France); Sec. Lt. W. Mellor (I. Force) (France); Lt. (actg. Capt.) E. Meynell, D.C.M. (Mediterranean); Maj. J. S. Mills, D.S.C. (Coast Patrol).

Sec. Lt. H. Nelson (I. Force) (France); Sec. Lt. H. W. Nicholl (I. Force) (France); Lt. L. Nicholson, M.M. (R.E. and M.G.C.) (Coast Patrol); Lt. R. A. Nicholson (Coast Patrol).

Sec. Lt. F. O'Donnell (I. Force) (France).

Sec. Lt. C. T. H. Pack (I. Force) (France); Lt. J. Parke, D.F.C. (I. Force) (France), Lt. F. Pascoe (Welsh R.) (I. Force) (France); Sec. Lt. A. W. Peppercorn (I. Force) (France); Lt. W. H. D. Phillips (France); Capt. J. W. Pinder, D.F.C. (I. Force) (France); Lt. H. W. Piper (France); Lt. (actg. Capt.) N. P. Playford (Vendome) (Paris); Sec. Lt. F. Polley (I. Force) (France); Capt. O. I. Preston, M.C. (France); Capt. E. R. Pritchard (Coast Patrol); Sec. Lt. H. A. Pritchard (Coast Patrol); Lt. W. J. Pullen (H.A.C.) (Flanders); Lt. F. G. Pym (France).

Lt. C. J. Ramsbottom (France); Capt. V. H. Ramsden (Coast Patrol); Capt. E. B. A. Rayner (I. Force) (France); Capt. W. E. Reason (I. Force) (France); Sec. Lt. A. G. V. Reeves (Coast Patrol); Lt. H. Riches (France); Lt.-Col. C. W. Risk (R.M.L.I.) (Mediterranean); Lt. (actg. Capt.) L. Robertson (France); Lt. F. C. Robinson (Coast Patrol); Capt. L. H. Rochford, D.S.C., D.F.C. (France); Lt V. F. A. Rolandi (Coast Patrol); Sec. Lt. J. W. Rose, D.S.M. (Mediterranean); Capt. J. Rothwell (Mcd. Service) (Coastal Service); Maj. F. T. Ryan, M.C. (R.A.) (France).

Lt. M. F. Scott (Coast Patrol); Lt. G. T. Scott (Can. E.F.) (Coast Patrol); Lt. (actg. Capt.) J. C. B. P. Seaver (I. Force) (France); Capt. A. T. Sketchley (Coast Patrol); Lt. J. A. Smale (Coast Patrol); Lt. C. T. Smith (France); Maj. (actg. Lt.-Col.) S. Smith, D.S.O., A.F.C. (France); Maj. W. Smith, M.C., D.C.M. (Lond. R.) (France); Lt. W. Smith (20th Group) (Coast Patrol); Capt. (actg. Maj.) T. R. Spence (Mediterranean); Sec. Lt. C. H. B. Stevenson (I. Force) (France); Capt. R. Millar (Stirling) (Coast Patrol); Capt. C. H. Stokes, D.F.C. (France); Lt. (actg. Capt.) W. P. Suttle (I. Force) (France).

Lt. H. Lt. Tamplin (Coast Patrol); Capt. (actg. Maj.) A. Thornelow (Coast Patrol); Sec. Lt. (Hon. Lt.) E. Towill (Yorks. Hors.) (I. Force) (France); Capt (actg. Maj.) H. A. Treadgold, M.D. (R.A.M.C.) (Orkneys); Lt. G. E. Tugwell (Coast Patrol); Maj. (actg. Lt.-Col.) L. Tomkinson (Coast Patrol); Sec. Lt. A. Tytler (France); Sec. Lt. (actg. Lt.) J. E. Tyrrell (Egypt).

Sec. Lt. H. J. Usher (Coast Patrol).

Capt. W. W. Wakefield (Coast Patrol); Sec. Lt. W. Wallace (France); Lt. J. E. Watkins (Adriatic); Lt. (actg. Capt.) G. R. Westmacott, D.S.O. (G. Gds.) (I. Force) (France); Sec. Lt. (actg. Lt.) W. Wheatley (Coast Patrol); Lt. S. R. Winkworth (I. Force) (France); Capt.) H. Wise (Egypt); Maj. T. Wintle (I. Force) (France), Lt. N. H. Witter (Flanders); Capt. T. O. Wood (France); Lt. W. B. Woodland (Coast Patrol); Lt. C. F. R. Woolnough (Coast Patrol), Lt. O. E. Worsley (Mediterranean); Lt. E. C. B. Wright (Coast Patrol).

Civilian Clergy.

The Rev. W. H. Bryant (Mudros).

Warrant Officers, Non-Commissioned Officers and Men.

210534 A.M. 2 A. Adams (I. Force) (France); 60157 Flt. Serjt. W. F. Alborn (France); 63701 A.C. 1 G. Alexander (France); 7912 L.A.C. J. Alexander (France); 205138 Serjt. T. Ashman (Coast Patrol); 193544 Clk. 1 G. T. Atkinson (I. Force) (France); 314992 Flt. Serjt D. J. Ayres (H.M.S. "Manxman").

107209 Pte. 1 L. C. W. Bain (France); 56985 Flt. Clk. A. H. Baker (I. Force) (France); 207088 Flt. Serjt. G. T. Baldwin (France); 218928 A.M. 3 L. W. Barber (Coast Patrol), 406873 Serjt. J. Barnes (I. Force) (France); 204978 Ch. Mech. W. J. Barnes (Mediterranean); 6682 Flt. Clk. T. A. Bates (I. Force) (France); 46835 Ch. Mech. E. Belcher (I. Force) (France); 203376 Ch. Mech. G. Bell (Flanders); 222714 Serjt. J. S. Bell (Flanders); 202221 Serjt. Mech. A. T. Bent (I. Force) (France); 15950 A./S.M. 2 W. C. Billing (Coast Patrol); 115535 Cpl. W. Bingley (France); 15071 A.C. 1 N. H. Birkett (France); 211063 Serjt Mech. N. W. Bootes (Mediterranean); 215343 actg. Cpl. R. H. Box (Coast Patrol); 235500 actg. Serjt. W. F. Bradford (actg.) 206649 A.M. 2 (Mediterranean) (Coast Patrol); 20588; Ch. Mech F. E. Brisley (Flanders); 200121 Serjt Mech. M. H. Brown (Mediterranean); 204721 Flt. Serjt. S. W. Brown (I. Force) (France); 225310 L.A.C. T. G. Burrell (Coast Patrol).

20074 Cpl. Clk. B. Cassam (I. Force) (France); 6250 S.M. 1 G. Chapman (India); 214176 Serjt. W. F. Chord (India); 46350 Cpl. Mech. W. J. Clark. (I. Force) (France); 211591 Ch. Mech. W. F. Clarke (I. Force) (France); 853 Cpl. W. Clarke (France); 16770 Serjt. E. Crooks (France); 4727 Serjt. (actg. Flt. Serjt.) J. Curry (France).

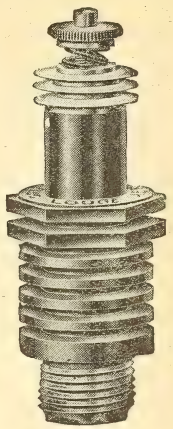
38366 Cpl. E. Davidson (France); 202841 Serjt Mech. R. S. Denman (Flanders); 210814 A.M. 1 A. Dobicar (R.N.) (Verdome); 210468 L.A.C. T. F. W. Dobson (Scillies).

216004 Serjt. Clk. R. S. Easby (I. Force) (France); 12223 Cpl. Mech. L. Edge (I. Force) (France); 30618 Serjt S. M. Evans (France); 18250 Serjt. Clk. W. C. Exton (I. Force) (France)

42212 A.C. 1 W. Farmer (France); 215183 actg. Serjt. Clk. T. J. Fawdry (Mudros).

208221 Serjt Mech. J. R. Gardner (Ægean); 211556 Serjt. Mech. W. G. Gardner (I. Force) (France); 17130 L.A.C. A. Garfath (France); 18622 A./C. F. J. George (France); 226701 Cpl. Clk S. J. Goldston (I Force) (France); 223206 Flt. Serjt. F. Goodman (Vendome) (Paris); 204436 Serjt.

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231739 Serjt. Mech. J. Hall (Coast Patrol); 984 Flt. Serjt. W. Hamilton (France); 267814 Clk./A. Hancock (I. Force) (France); 228916 A.C.1 J. Hartley (France); 879 Serjt. G. S. Hartman (France); 37866 Cpl. W. H. Heath (France); 314239 Serjt. A. L. Henderson (Taranto); 215779 Serjt. S. C. Holman (Coast Patrol); 225556 Serjt. Mech. R. J. Hopkinson (I. Force) (France); 265113 Serjt. Clk. E. C. Hopper (I. Force) (France); 7128 L.A.C. (actg. Cpl.) P. G. Hounson (France); 86278 Clk.1 J. Hunter (I. Force) (France); 159056 Flt. Serjt. C. F. Hurley (Coast Patrol).

202611 Cpl. Mech. H. Jackson (Coast Patrol); 54910 Cpl. T. J. Jackson (I. Force) (France); P.O./M15713 Sick Bay Attendant T. P. Jackson (Thasos); 275939 A.M.2 R. Jones (I. Force) (France); 68935 L.A.C. W. N. Jones (France).

214810 Serjt. Clk. J. A. C. Kelland (Ægean); 205938 Cpl. G. W. Kellock (Coast Patrol); 22087 L.A.C. A. Kendrick (France); 19497 Flt. Clk. E. W. King (I. Force) (France); 10338 Serjt. G. T. King (France).

231733 A.M.1 F. Lake (I. Force) (France); 218823 Serjt. Mech. J. W. Lamb (Flanders); 205002 Serjt. Mech. R. G. H. Lamb (Flanders); 47417 L.A.C. U. Lancaster (France); 21251 A.C.1 D. J. Langford (France); 18014 Flt. Clk. W. S. Leigh (I. Force) (France); 213497 Serjt. Obs. W. R. Liddiard, D.S.M. (Coast Patrol); 202962 Serjt. W. F. Lindley (Flanders).

210979 Cpl. Clk. W. McGill (Mediterranean); 38128 L.A.C. G. R. MacFarlane (France); 200760 Cpl. D. MacKenzie (Scillies); 217163 Serjt. Clk. C. M. Maffey (I. Force) (France); 223837 Serjt. P. Manser (Coast Patrol); 252 Serjt.-Maj. D. Martin, M.M. (I. Force) (France); 314205 Flt. Serjt. J. Martin (R.N.A.S. "Riviera"); 205507 Serjt. Mech. H. G. Mayes, D.S.M. (H.M.S. "Riviera"); 213002 Serjt. Mech. E. C. Mead (I. Force) (France); 9008 Flt. Serjt. R. Mersy (France); 314303 Serjt. J. E. Milner (Otranto); 313834 Flt. Serjt. W. G. Minter (Flanders); 4263 Flt. Serjt. A. Mockford (France); 18495 L.A.C. R. Moffatt (France); 1103 Flt. Serjt. H. J. Moir (France); 4004 Clk. Mech. G. Morrison (I. Force) (France); 16049 Clk. Mech. A. Moulton (I. Force) (France).

8968 A.C.1 H. S. Newell (France); 19100 Serjt. S. Noble (France).

207515 Serjt. Mech. A. C. Oatway (I. Force) (France); A./314681 Signalman A. R. Osborne (Hornsea) (Coast Patrol)

1050 Flt. Serjt. C. Nunn (France).

37416 A.M.1 C. W. Pankhurst (I. Force) (France), 205706 Serjt. S. F. Patterson (Coast Patrol); 18780 Serjt. J. Penman (France); 212608 Serjt. Mech. J. C. Pickering (Ægean); 24401 A.C.1 J. Pierson (France); 16426 Serjt. A. W. Pilcher (France); 402956 Cpl. F. S. Plumpton (I. Force) (France); 206602 Ch. Mech. A. Poulton (Flanders); 209261 Flt. Serjt. H. W. Powell (Coast Patrol); 202081 Ch. Mech. H. G. Priest (I. Force) (France); 37496 Serjt. Clk. H. T. Pywell (I. Force) (France).

209730 Serjt. W. H. W. Quantrell (Coast Patrol).

51813 Ch. Clk. J. S. R. D. Rawcliffe (I. Force) (France); 17388 Ch. Mech. J. Redpath (I. Force) (France); 1105 Serjt. H. Ricardo (France); 206096 A.M.1 (actg. Cpl.) F. Riley (I. Force) (France); 1251 Ch. Mech. A. A. Robinson (I. Force) (France); 213628 Flt. Serjt. C. T. Rogers (Vendome) (Paris); 2658 Serjt. Clk. E. Roughton (I. Force) (France); 19013 Flt. Serjt. N. W. Russell (France); 118235 Cpl. Mech. T. Ryan (I. Force) (France).

31875 Serjt. O. E. Sewell (Malta); 213508 Serjt. Clk. A. G. Sheppard (Flanders); 213787 Cpl. Clk. W. C. Shilling (Mediterranean); 17069 Serjt. (actg. Flt. Serjt.) A. Slater (France); 202315 Serjt. Clk. H. A. Smale (I. Force) (France); 3825 Ch. Mech. A. Smallman (I. Force) (France); Flt. Serjt. D. M. Smith (France); 22846 L.A.C. L. T. Smith (France); 23855 Serjt. (actg. Flt. Serjt.) A. J. Smith (France); 1251 Ch. Mech. G. H. Spong (I. Force) (France); 203118 Mas. Mech. T. Stainsfield (Mediterranean); 21435 L.A.C. (acte Cpl.) H. W. Sutton (France); 220270 Serjt. L. A. Sweny (Coast Patrol).

60442 A.M.1 F. W. Taylor (I. Force) (France); 23612 A.C.1 J. G. Taylor (Ægean); 20787 Serjt. Mech. S. Thomas (Mediterranean); 67062 Cpl. Mech. F. Thompson (I. Force) (France); 763320 C.S.M. H. L. Thompson (Can. Fsty. Corps) (France); 44624 A.M.1 G. H. W. Thorpe (I. Force) (France); 216825 A.C.1 H. G. Tilby (Flanders); 23568 Flt. Serjt. W. A. Tracey (France); 15961 Serjt. W. R. Trelease (France); 81876 Pte. F. W. Tunnicliffe (I. Force) (France); 208268 Flt. Serjt. A. Turner (France); 206708 Serjt. H. H. Tuting (Coast Patrol)

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AIR MINISTRY, June 17th.

R.A.F.—Brig.-Gen. (Staff).—Lt.-Col. C. L. N. Newall, C.M.G., A.M., to be graded for purposes of pay and allowances as Brig.-Gen. (Staff), May 1st, whilst empld. as Chief Staff Officer of an Area.

The following temp appointments are made:—Staff Officers, 2nd Class.—(P.) Capt. A. H. S. Baker, Nov. 18th, 1918, and to be actg. Maj. till April 30th, vice Capt. (Hon. Maj.) (actg. Maj.) R. H. Howell (substituted for notification in "Gazette," April 29th); (T.) Maj. J. T. Babington, D.S.O., June 11th.

FLYING BRANCH.—Lt.-Col. W. R. Freeman, D.S.O., M.C., to be Lt.-Col. (A.), from Group Comdr., June 3rd.

Maj. R. Grey to be actg. Lt.-Col. whilst empld. as Lt.-Col. (A.), April 24th.

Capt. H. C. Irwin to be graded for purposes of pay and allowances of Capt. whilst empld. as Capt. (A'ship), Nov. 5th, 1918 (substituted for notification in "Gazette," May 6th).

Capt. C. A. Hervey to be graded for purposes of pay and allowances of Capt. whilst empld. as Capt. (K.B.), Jan. 1st.

Lt. H. A. Miller to be actg. Capt. whilst empld. as Capt. from Dec. 1st, 1918, to May 27th.

Lt. A. C. Upham to be Lt. (A.), and to relinquish the actg. rank of Capt. on ceasing to be empld. as Capt., March 14th, 1919.

The following Sec. Lts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lts. (A.):—F. C. Hilbert, June 20th, 1918; W. E. Gemmell, July 26th, 1918; S. R. Dickson, Sept. 22nd, 1918.

The following relinquish their comms. on ceasing to be empld.:—Lt. J. Malcolm (Lt. (late Forestry Corps), Feb. 7th); Capt. W. J. Rutherford (Lt. (temp. Capt.), Quebec R.), March 31st; Lt. A. A. Browne (Lt., N.Z.), April 24th; Lt. R. Dodds, M.C. (Lt. (temp. Capt.) Cent. Ont. R.), May 4th; Lt. H. A. O'Connor (Lt., R.C.A.), May 16th; Sec. Lt. (Hon. Lt.) S. J. R. B. Simmons (Lt., Lond. R.), May 27th; Sec. Lt. (Hon. Lt.) G. Ibberson (Lt., Border R.), June 2nd.

Transferred to unempld. list:—Sec. Lt. D. Henderson, Jan. 8th; Sec. Lt. J. M. Adams, Jan. 26th, Lt. M. A. Watney, Jan. 27th; Lt. F. S. Clarke, March 4th; Sec. Lt. F. J. Parker, March 14th; Capt. G. L. Hartgill, March 17th; Lt. W. A. Hunter, April 14th; Sec. Lt. F. G. Smith, April 17th (substituted for notification in "Gazette," May 2nd); Sec. Lt. V. R. Hicks, April 18th; Sec. Lt. R. Harris, April 19th; Lt. F. O. Mann, April 25th; Sec. Lt. N. F. Hirst, April 28th; Lt. C. C. G. Girvan, M.C., April 30th; Lt. J. D. Smith, May 1st; Lt. H. H. Foster, May 4th; Sec. Lt. C. L. Hicks, Lt. L. G. Hills, Sec. Lt. E. A. O. Simpson, Sec. Lt. J. H. Taylor, May 8th; Sec. Lt. H. Hill, Sec. Lt. L. Reader, May 11th; Sec. Lt. G. F. Robinson, May 13th; Lt. W. Fairweather (R. Scots. Fus., T.F.), May 16th; Lt. L. H. Ray, Sec. Lt. C. N. Reinhardt, Sec. Lt. A. B. Rosevear, Sec. Lt. C. B. Rutherford, Sec. Lt. H. V. Sariceat, Lt. N. B. Scott, Lt. R. G. Scarson, Sec. Lt. K. N. Stone, Sec. Lt. R. C. Stout, May 20th; Sec. Lt. A. T. Batchelor, May 22nd (substituted for notification in "Gazette," Jan. 24th); Sec. Lt. A. M. Avery, Sec. Lt. E. J. Evans, Sec. Lt. H. M. Smith, May 23rd; Lt. R. H. Knapton (D.L.I., T.F.), May 27th; Sec. Lt. H. H. Fox (Lord on R.), May 28th; Sec. Lt. A. E. Baxter, Sec. Lt. (Hon. Lt.) V. Brent, Lt. J. S. Morgan, Capt. H. Tether, Lt. L. M. Van Eyssen, Sec. Lt. G. Windle, May 29th; Sec. Lt. N. Sillars, Sec. Lt. W. A. Warwick, May 30th; Sec. Lt. R. Coombs-White, Sec. Lt. S. A. Huggard, Sec. Lt. A. L. Pearce, May 31st; Sec. Lt. R. R. E. Dimmick, Sec. Lt. F. D. Wilkinson, June 1st; Lt. R. S. Carroll, A.F.C., June 2nd, 1917; Sec. Lt. G. A. Duthie, Lt. N. L. Garstin, Sec. Lt. F. Hughes, Sec. Lt. H. Jones, June 4th; Lt. E. H. Evans (R.W. Kent R.), June 5th; Lt. J. Virgo, June 8th; Lt. H. V. C. Luyt, June 12th; Lt. F. C. D. Dymant, June 13th; Lt. C. H. Flére, June 14th; Lt. F. A. N. Duk (substituted for notification in "Gazette," Feb. 11th), Sec. Lt. N. J. Eddy, Lt. C. W. McL. Gray, June 15th; Sec. Lt. R. Biggs, Lt. O. C. Dawson, D.F.C., Sec. Lt. E. R. Fison, Lt. R. A. Mayne, June 16th; Sec. Lt. A. Mulroy, June 17th.

Lt. (Hon. Maj.) C. R. Ingleby relinquishes his commn. on account of ill-health caused by wounds, and is granted rank of Maj., May 24th.

Lt. (Hon. Capt.) C. E. Holman relinquishes his commn. on account of ill-health, and is granted the rank of Capt., May 20th.

The following relinquish their comms. on account of ill-health and are permitted to retain their rank:—Lt. F. Adams (caused by wounds), May 15th; Lt. W. G. Claxton, D.S.O., D.F.C. (caused by wounds), May 20th; Sec. Lt. R. C. Blanchard (contracted on active service), May 27th.

Lt. W. F. Creery (Conn. Rangers) resigns his commn., and is permitted to retain his rank, June 18th.

The surname of Lt. E. R. Jones is as now described, and not "Jones," as stated in "Gazette," March 28th.

The notification in "Gazette," Feb. 4th, concerning Lt. C. F. Day (Lt., E. Ontario R.) is cancelled.

The notification in "Gazette," April 18th, concerning Lt. F. G. Carpenter is cancelled.

The notification in "Gazette," April 29th, concerning Sec. Lt. J. Cooke is cancelled.

The notification in "Gazette," May 13th, concerning Sec. Lt. F. D. Cowan is cancelled.

The notification in "Gazette," May 30th, concerning Sec. Lt. A. A. Baker is cancelled.

ADMINISTRATIVE BRANCH.—Maj. R. H. Howell to be Maj., from S.O., Nov. 18th, 1918 (substituted for notification in "Gazette," May 27th).

Maj. F. B. Burton to be Maj., from S.O., May 1st.

Sec. Lt. J. Grant to be graded for purposes of pay and allowances of Maj. whilst empld. as Maj., May 1st.

Capt. C. D. Smart, M.C., to be Capt., from (A.), June 3rd, 1918 (substituted for notification in "Gazette," April 8th).

Lt. H. Hannay (temp. Capt., R.A.S.C.) is granted a temp. commn. as Capt., while empld., from April 1st, 1918, Oct. 20th, 1918.

Lts. to be graded for purposes of pay and allowances of Capts. whilst empld. as Capts.:—T. F. Davis, R. T. Kelly, May 1st.

Lt. W. H. Crotty to be graded for purposes of pay and allowances as Capt. whilst empld. as T. Officer, May 21st.

Sec. Lt. J. McCilley to be graded for purposes of pay and allowances as Capt., whilst empld. as Capt., May 1st.

Lt. L. H. Hillier to be Lt., from (A.), April 17th

Lts. to be Lts., from (S.O.):—D. Blairman, F. A. Corbett, May 1st (substituted for notification concerning these officers which appeared in "Gazette" of May 16th).

The following are granted temp. commns. as Lts.:—A. E. Enders (Lt. and Ormr., Spec. List), April 26th, 1918, P. L. Harris (temp. Lt., R. Irish Rif.), Aug. 8th, 1918, with seny. from April 1st, 1918; A. T. Redgwell (temp. Lt., Spec. List), Sept. 17th, 1918, with seny. from April 1st, 1918.

Sec. Lt. W. D. Cooney, to be actg. Lt., with pay and allowances of that rank, while empld. as Lt., from Sept. 16th, 1918, to April 30th (substituted for notification in "Gazette," May 23rd).

Sec. Lt. A. Bernard (late Gen. List, R.F.C., on prob.) is confirmed in rank as Sec. Lt., Sept. 14th, 1918.

The following relinquish their commns. on ceasing to be empld.:—Sec. Lt. (actg. Lt.) E. F. P. Bartlett (Lt., Hants R.), Feb. 15th; Capt. E. Mills (Capt. and Ormr., R. West Kent R.), June 3rd.

Transferred to unempld. list:—Sec. Lt. C. Caldwell, March 5th; Sec. Lt. G. S. Cowan, March 7th; Lt. W. F. Hughes, April 1st; Sec. Lt. A. B. Godmas, Sec. Lt. E. T. Taylor (R.F.A., T.F.), April 30th; Sec. Lt. A. Elliott (R. Lancs. R.), May 5th; Capt. A. H. Hulton, May 9th; Sec. Lt. S. B. L. Hall, May 12th; Sec. Lt. W. P. Smitton, May 15th; Lt. N. I. Brockbank, D.F.C., Sec. Lt. G. F. Tidbury, May 31st; Capt. H. A. Maynard, June 1st.

Capt. J. Allen relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, June 5th.

Capt. H. W. Morgan (K.R.R.C.) relinquishes his commn. on account of ill-health contracted on active service, May 29th.

Lt. V. B. Allen relinquishes his commn on account of ill-health, and is permitted to retain his rank, May 20th (substituted for notification in "Gazette," Feb. 18th).

Lt. F. W. Young (Worc. R.) relinquishes his commn. on account of ill-health contracted on active service, June 2nd.

The notification in "Gazette," May 25th, 1918, concerning Sec. Lt. E. G. Brett is cancelled.

The notification in "Gazette," Dec. 13th, concerning J. H. Hannay is cancelled.

The notification in "Gazette," Jan. 21st, concerning J. H. Hannay is cancelled.

The notification in "Gazette," Feb. 25th, concerning Sec. Lt. J. M. Adams (Gordon Highrs.) is cancelled.

The notification in "Gazette," April 11th, concerning Sec. Lt. F. A. Pritchard is cancelled.

The notification in "Gazette," May 6th, concerning Sec. Lt. C. L. H. Johnson (Essex R.) is cancelled

The notification in "Gazette," May 27th, concerning Capt. (Hon. Maj.) T. M. Neil is cancelled.

The notification in "Gazette," May 27th, concerning Lt. (Hon. Capt.) F. F. McKenna is cancelled.

The notification in "Gazette," May 30th, concerning Sec. Lt. A. E. H. Hales is cancelled.

TECHNICAL BRANCH.—Lt.-Col. T. E. St. C. Daniel, O.B.E., M.C., to be Lt.-Col., from Deputy Director, April 1st to April 30th (substituted for notification in "Gazette," June 6th).

Capt. C. D. Smart, M.C., to be Lt. (Hon. Capt.), Grade A., from (A.), Feb. 10th (substituted for notification in "Gazette," April 8th).

Lt. F. Briggs to be actg. Capt. whilst empld. as Capt., Grade (B), Dec. 1st, 1918, to April 30th.

Lts. to be graded for purposes of pay and allowances of Capt. whilst empld. as Capts., Grade (A):—(Hon. Capt.) J. F. Bargman, A. Howard, E. P. Moulder, P. Murphy, A. J. M. Ross, May 1st.

Lt. J. E. R. Avery to be graded for purposes of pay and allowances of Capt. whilst empld. as Capt., Grade (B), May 1st.

Lt. R. Macfarlane to be Lt., Grade (A), from (Ad.), May 13th.

Lt. W. a. B. Probart to be Lt., Grade (A), from (Ad.), Nov. 7th, 1918 (substituted for notification in "Gazette," May 20th)

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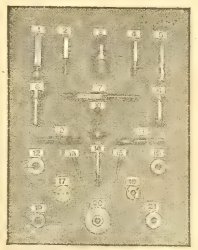
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Lt. A. E. Burton to be Lt., Grade (B), from (Ad.), May 5th.

Sec. Lts. to be graded for purposes of pay and allowances of Lts whilst empld. as Lts., Grade (A) :—A. H. Harrison, E. W. Hooton-Smith, May 1st.

Sec. Lt. S. F. Coleman to be Sec. Lt., Grade (A), from (A.), May 31st.

Sec. Lt. E. H. Hughes to be Sec. Lt., Grade (A), from Grade (B), Oct. 25th, 1918 (substituted for notification in "Gazette," Jan 24th).

Sec. Lt. J. A. Wilson to be Sec. Lt., Grade (B), from (O), May 31st.

Lt. H. B. Harvey (Lt., R.H. and R.F.A.) relinquishes his commn. on ceasing to be empld., June 3rd.

Sec. Lt. (Hon. Lt.) L. G. Martin has been transferred temporarily to the unempld. list from March 27th to May 7th.

Transferred to unempld. list :—Maj. G. Hazelton, Lt. A. Hingston, April 1st; Lt. F. O. Browson, April 15th; Sec. Lt. H. P. Leigh, May 2nd; Capt. H. E. Hickmott, May 3rd; Sec. Lt. (Hon. Lt.) W. A. Hipkiss, May 6th; Lt. (Hon. Capt.) H. J. O. Barnett, May 14th; Sec. Lt. (Hon. Capt.) J. E. Appleyard, May 17th; Sec. Lt H. Davis (E. Yorks. R.), May 23rd; Sec. Lt. E. A. Rapley, May 28th; Sec. Lt. G. R. Barry, Lt. C. G. Boot, Lt. A. W. Furbank, June 2nd; Capt. T. F. Gillespie, June 17th.

Sec. Lt. C. D. Watt relinquishes his commn on account of ill-health, and is permitted to retain his rank, May 19th (substituted for notification in "Gazette," Jan. 7th).

Medical Branch.—A. L. Robinson is granted a temp. commn. as Capt., June 13th.

Capt. R. C. Fuller is transferred to unempld. list, April 10th.

Chaplains Branch.—The Rev. J. O. Thomas, M.C. (temp. Chap. to the Forces, 4th Class, R.A.C.D.), is granted a temp. commn as Chaplain with relative rank of Capt., June 12th.

Memoranda.—The following are granted the actg. ranks stated against their names, with effect from May 1st :—

To be actg. Lt.-Cols. while specially empld. :—Maj. R. Hall, M.B.E., Maj. E. L. Conran, M.C., Maj. E. H. Sparling, Maj. O. T. Boyd, M.C.

To be actg. Majs. whilst specially empld. :—Capt. L. M. Lilley, O.B.E., Capt. L. J. Bayley, M.C., Capt. F. R. P. Dexter, Capt. F. H. Hawksford, Capt. A. Innes, M.C., Capt. M. A. Seymour, Capt. R. S. Booth, Capt. C. Hodgkinson-Smith, Lt. W. Watson, Lt. F. H. Hooper.

To be actg. Capts. whilst specially empld. :—Lt. (Hon. Capt.) L. N. Sutherland, Lt. G. H. Havelock-Sutton, M.C., Lt. A. Eggar, Lt. L. G. Paget, Lt. L. Clarke, Lt. A. J. G. Styran, M.C., Lt. G. C. O'Donnell Lt. C. E. W. Lockyer, Lt. J. Cullen, A.F.C., Lt A. E. L. Skinner, M.C., Lt. W. Sharpe, Lt. C. A. Farquharson, Lt. A. A. Makins, Lt. G. J. Blackmore, Lt. A. M. Thomson, Lt. H. D. Lehmann.

The following are granted the actg. rank of Maj. without pay and allowances of that rank whilst empld. as Recruiting Officers, with effect from May 1st :—Capt. W. G. Scott, Lt. F. T. Chapman, Lt. R. Tait, Lt. G. B Redgrave, Lt. A. R. Harris, Lt. F. V. Ecll, Sec. Lt. A. E. H. Hales.

Flt. Cadet 740482 V. Sparkes is granted an honorary commn. as Sec. Lt., June 14th.

The following relinquish their commns. on ceasing to be empld. :—Temp. Hon. Lt. L. G. Parker, April 9th; Temp Hon. Lt. J. L. Manson, Temp. Hon Capt. L. F. de Peyrecave, April 17th; Temp. Hon. Capt. C. H. Adams, May 21st; Temp Hon. Lt. W. C. S. Phillips, June 16th.

Air Ministry, June 20th.

R.A.F.—The following temp. appointments are made at the Air Ministry :—Chief of Air Staff.—Maj.-Gen. Sir H. M. Trenchard, K.C.B., D.S.O., Feb. 11th (substituted for notification in "Gazette," May 20th.

Director of Training and Orgauisation.—Col. (actg. Maj.-Gen.) P. W. Game, C.B., D.S.O., relinquishes the actg. rank of Maj.-Gen. and to be actg. Brig.-Gen. while so empld., March 8th (substituted for notification in "Gazette," May 20th).

Director of Equipment.—Col. (actg. Maj.-Gen.) C. L. Lambe, C.M.G., D.S.O., relinquishes the actg. rank of Maj.-Gen and to be actg. Brig.-Gen. while so empld., Feb. 27th (substituted for notification in "Gazette," May 20th).

Deputy Directors.—Lt.-Col. E. R. Ludlow-Hewitt, C.M.G., D.S.O., M.C., and to be actg. Col. while so empld., June 1st; Col. E. C. H. Drew, C.M.G., from Director, May 1st to June 7th; Lt.-Col. J. C. Hearson, C.B.E., D.S.O., from Director, May 1st to May 21st, and to be actg. Col. while so empld.

Staff Officer, 1st Class (Air).—Maj. G. J. Watney, May 1st.

Staff Officers, 2nd Class :—Capt. W. E. G. Bryant, Maj. E. G. H. Clarke, M.C., from S.O., 1st Cl., Capt. B. H. Sisson, May 1st. (T.) Capt. (actg. Maj.) L. J. Killmayer, M.B.E., March 13th, and to retain the actg. rank of Maj., till April 30th.

Staff Officers, 3rd Class (Air).—Maj. J. E. Speranza, from S.O., 2nd Class; Capt. W. A. A. Chauncy, from S.O., 2nd Class; Capt. C. S. Morice, M.C., Capt. R. N. R. Morgan-Stuart-Wortley, M.C.; Capt. G. L. Tyser, May 1st; Capt. V. R. Gibbs, D.S.C., May 26th (P.)—Capt. H. M. Earnshaw, June 6th, vice Capt. P. A. Moodie.

Staff Officer, 4th Cl. (Air).—Lt. B. H. Godfrey, May 1st.

The following temp. appointments are made :—Staff Officer with Fleet.—Lt.-Col. R. E. Creigs, D.S.O., A.F.C., and to be graded for purposes of pay and allowances as Col., Staff, from (A. and S.), June 5th, vice Lt.-Col. (actg. Col.) R. H. Clark-Hall, D.S.O.

Staff Officers, 1st Class (Air).—Lt.-Col. J. R. W. Smyth-Pigott, D.S.O., May 24th; (P.)—Lt.-Col. L. W. B. Rees, V.C., M.C., A.F.C., April 30th.

Staff Officer, 2nd Class (Air).—Maj. G. F. H. Fatlull, June 10th.

Staff Officer, 3rd Class (P.).—Lt. L. C. Tyson, April 30th.

Flying Branch.—Sec. Lt. H. Douglas to be Lt., Oct. 15th, 1918.

Flt. Cadet F. O. Huntrods is granted a temp. commn. as Sec. Lt. (O.), Nov. 30th, 1918.

The following relinquish their commns. on ceasing to be empld. :—Lt. R. Brown, July 13th, 1918; Sec. Lt. (Hon Maj.) H. Priestman (Maj., New Brun R.), Oct. 5th, 1918; Sec. Lt. T. E. Winkworth (Lt., Can. Forces), Feb. 2nd; Lt. E. E. Burdett (Lt., Cent Ont R.), Feb. 21st; Sec. Lt. J. Atkinson (Sec. Lt., Border R., I.F.), March 3rd; Lt. H. B. P. Boyce (Lt., Sask. R.), April 19th; Lt. W. G. Bell (Lt., Can. Ont. R.), Lt. W. A. Campbell (Lt., Can. Reserves), May 1st; Sec. Lt. (Hon. Capt.) W. Mackenzie (Capt., N.Z. Dental C.), May 6th; Sec. Lt. (Hon. Lt.) W. J. Dalzeil (Lt., Sask. R.), May 9th; Lt. A. Maxwell (Lt., R. Scots), May 13th; Sec. Lt. (Hon. Lt.) R. A. Neilson (Lt., Can. F. Art.), May 19th; Lt.-Col. W. H. M. Campbell, D.S.O. (Capt., Shrops. L.I.), May 28th; Lt. A. W. J. Lyons (Sec. Lt., R.A.S.C.), May 30th.

Transferred to unempld. list :—Lt. S. F. Macpherson, Jan. 10th; Lt. J. A. F. Burwash, Feb. 17th; Lt. J. S. Owden, Feb. 19th; Sec. Lt. N. Kirkpatrick, March 1st; Sec. Lt. J. Martin, M.M., March 3rd; Sec. Lt. S. E. Silbey, March 9th; Lt. W. R. Vane, March 7th (substituted for notification in "Gazette," April 1st); Lt. H. Austin, Lt. W. J. C. Smith, March 15th; Lt. (actg. Capt.) J. S. Ralston, M.C., D.F.C. (Scottish Rifs., T.F.), March 19th; Sec. Lt. J. R. B. Kay, March 24th; Sec. Lt. M. McLean, March 20th; Lt. L. W. Kinzer, Sec. Lt. E. G. MacKay, Sec. Lt. A. E. Naylor, Lt. C. E. Perkins, Sec. Lt. J. W. Weir, April 1st; Lt. A. H. Kerr, April 12th, 1918; Sec. Lt. W. T. Jones, Sec. Lt. A. G. Johnston, April 13th; Sec. Lt. R. E. Kestell, April 14th; Lt. H. J. Buist, April 15th; Lt. W. B. B. Jeffrey, April 16th; Sec. Lt. W. Knight, Sec. Lt. R. A. Macdonnid, Sec. Lt. T. J. McGrath, Sec. Lt. G. E. Macklem, Sec .Lt. H. L. Moorhouse, Sec. Lt. C. W. Meyers, Sec. Lt. O. S. McCutcheon, Lt. C. P. MacDonald, Sec. Lt. F. A. Porter, April 19th; Sec. Lt. P. V. Kilby, Lt. J. Parke, D.F.C., April 20th; Lt N. H. Jay, April 22nd; Lt. E. L. Ward, April 23rd; Sec. Lt. Q. K. Kanthack, Sec. Lt. R. P. Kear, April 24th; Sec. Lt. G. G. Cates, Sec. Lt. G. W. Hammond, Lt. B. H. Reynolds, April 25th; Sec. Lt. E. G. Weaver, April 26th; Capt. J. F. Johnson, Sec. Lt. J. W. Kelland, Sec. Lt. S. F. Legge, April 28th; Lt. G. W. Joyce, Sec. Lt. F. C. Marriott, Lt. D. M. McGoun, M.C., April 29th; Lt. J. W. S. Mellish, Sec. Lt. D. G. Tory, April 30th, Capt. I. G. Kelly, May 1st; Sec. Lt. F. Latimer, May 4th; Lt. T. K. Brackett, May 5th; Sec. Lt. C. Keene, Sec. Lt. J. L. Lund, M.C., May 7th; Sec. Lt. F. Johnson, Lt. W. E. Kent, May 8th; Sec Lt. W. G. Perry, Sec. Lt. W. R. Thomson, May 9th; Lt. A. F. Sanders, May 10th; Sec. Lt. F. W. Roadhouse, May 13th; Sec. Lt R. S. Kenyon, May 14th; Sec. Lt. B. Knee, Lt. M. E. Mowat, Sec. Lt. H. S. Matthews, May 15th, Sec Lt. W. Mc Eachran, Sec. Lt. J. Skidmore, May 17th; Lt. C. K. Studd, Lt. R. T. Symond, M.C. (L'pool R., T.F.), May 18th; Sec. Lt S. R. Darke, Sec. Lt. D. J. Dyer, Lt. E. Frost, Sec. Lt J. H. Glen, Sec. Lt. A. B. Jones, Sec. Lt. R. H. Nicholls, Sec. Lt. L. S. Ros, Sec. Lt. F. T. Sargent, Sec. Lt. T. W. Seymour, Sec. Lt. L. Satterthwaite, Sec. Lt. W. F. Teale, May 20th; Sec. Lt. C. V. Hicks, May 21st; Sec. Lt. I. L. Dutton, Sec. Lt. S. H. Emerson, Lt. A. McGregor, D.F.C., Lt. H. S. Morton, Sec. Lt. H. P. Moore, May 23rd; Lt T. Llewellyn, May 24th, Lt. R. Hunter, Lt. E. A. Mallett, May 25th; Capt. E. N. Chandler, D.F.C., Sec. Lt. T. L. James, May 26th; Capt. C. J. Knight, Sec. Lt. J. D. A. Ness, Sec. Lt. R. T. North, May 28th; Lt. B. A. Butt, May 29th; Lt. T. H. Boyd, Sec. Lt. W. H. S. Davis, Lt. E. S. Dean, A.F.C., Capt. D. G. McGregor, Lt. H. A. Pearson, M.C., D.F.C., Lt. L. Seymour, Sec. Lt. H. W. Taylor, M.C., May 30th; Lt. J. R. Budd, Lt. V. A. Bishop, Lt. H. J. Cockman, D.F.C., Sec. Lt. H. Halaway, Sec. Lt. H. V. David, Sec. Lt. C. W. Dicks, Sec. Lt. F. J. Griffiths, May 31st; Sec. Lt. A. Brown, Lt. L. F. Collin (Essex R., T.F.), June 1st; Sec Lt. E. V. Kennedy, June 2nd; Lt. J. A. Butler, Lt. J. E. Edgar, Sec. Lt. F. Frith, Lt J. S. Ralph, June 3rd; Sec. Lt. J. A. Bell (North'd Fus.), Sec. Lt. D. W. P. Boyd, Lt. H. Brown, Sec. Lt. A. F. Brodbeck, Sec. Lt. H. E. Cowley, Lt. F. F. Dutton, M.C., D.F.C., Sec. Lt. W. Ellis, Sec. Lt. N. Ferrand, Sec. Lt. A. Garrod, Lt. J. L. Jones, Lt. J. H. L. Purkess, June 4th, Capt. C. W. Carleton, Lt. P. G. Goodger, June 5th; Sec. Lt. W. J. Bradshaw, Sec. Lt C. Bunch, Lt. H. W. Keight, June 6th; Sec. Lt. H. T. B Bentley, Lt. A. L. Godfrey, June 7th; Lt. J. E. A. Kernahan, June 11th; Sec. Lt. W. H. E. Graham, Sec. Lt. D. Laing, Sec. Lt. R. G. Lamplough, June 12th, Lt. L. Read, Sec. Lt. B. W. Thwaites, June 13th; Sec. Lt. G. W. H. M. Devenish, Sec. Lt. I. P. B. Davies, Sec. Lt. L. I. Deary, Sec. Lt. C. F. V. Duke, Sec. Lt. C. W. Tante, June 14th; Sec. Lt. H. V. Edkins, Sec. Lt. E. B. Gascoine, Lt. F. W. Thomas, June 15th; Sec. Lt. T. F. Davenport, Sec. Lt. E. H. Dodds, Lt. W. R. Greathead, June 16th; Lt. L. W. Butchart, June 20th.

Capt. C. D. Fuller (Lt., R. Suss. R.) resigns his commn and is granted the rank of Maj., June 21st.

Capt. W. A. Curtis, D.S.C., relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank, June 11th.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—J. N. Blacklock, June 4th; S. R. Coward (caused by wounds), June 6th.

Lt. G. M. Shaw (C. Gen. R.) relinquishes his commn on account of ill-health contracted on active service, May 21st.

The following Sec. Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank :—J. D. Irvine, Feb. 10th (substituted for notification in "Gazette," Jan. 28th); A. L. Fachnie, June 6th; J. H. Jacques (contracted on active service), June 8th; W. Cowan, June 12th.

The following Sec. Lts. are dismissed the Service :—W. F. Powers, Oct. 4th, 1918 (for absence without leave); G. Wayman, April 23rd.

The name of Sec. Lt. J. Spencer is as now described, and not as stated in "Gazette," April 23rd.

The Christian names of J. A. Fraser are as now described, and not A. J. Fraser, as stated in "Gazette," Oct. 25th, 1918.

The notification in "Gazette," May 23rd concerning A. J. Bird is cancelled.

The notification in "Gazette," April 4th, concerning Lt. W. J. Saunders is cancelled.

The notification in "Gazette," April 11th, concerning Lt. W. B. Walker, D.F.C., is cancelled.

The notification in "Gazette," Jan. 21st, concerning Capt G. L. Hartgill is cancelled ("Gazette" notice, June 13th, to remain).

The notification in "Gazette," April 18th, concerning Sec Lt. C. Macpherson is cancelled.

The notification in "Gazette," Oct. 29th, 1918, concerning Sec. Lt. E. P. Smith is cancelled.

The notification in "Gazette," June 10th, concerning Capt. J. Clisdal is cancelled.

The date of appointment of Sec. Lt. (Hon. Capt.) H. W. Reck to be Lt., Nov. 1st, 1918, and not March 20th, as stated in "Gazette," May 23rd.

The date of appointment of Sec. Lt. H. W. Heslop to be Lt. is April 9th, 1918, and not April 2nd, 1918, as stated in "Gazette," March 7th.

Administrative Branch.—The following are granted the actg. rank stated against their names, from May 1st :—Actg. Cols. :—Lt.-Col. F. H. G. Playfair, without pay and allowances of that rank whilst empld. as Permanent President of Courts Martial; Lt.-Col. A. W. C. McFall, with out pay and allowances of that rank, whilst empld. as Permanent President of Courts Martial; Maj. W. P. Alexander, with the pay and allowances of Lt.-Col. whilst empld. as Permanent President of Courts Martial. Actg. Lt.-Cols :—Maj. D. Mackenzie, whilst empld. as Permanent President of Courts Martial; J. R. Gould, (Capt., K.A.R.) is granted a temp. commn., Aug. 24th, 1918, and to be Hon. Capt.

Sec. Lts. to be Lts. :—R. N. Preece, July 22nd, 1918; W. B. Walker, D.F.C., March 1st.

The following are granted temp. commns. as Sec. Lts. :—H. J. Bamber, R. T. Barton, F. G Brigden, F. Narris, R. W Stewart, A. P. Webley, June 21st.

The following relinquish their commns. on ceasing to be empld. :—Sec. Lt. C. I. H. Johnson (temp. Sec. Lts., Essex R.), Aug. 10th, 1918; Lt. A. Rawlins (Lt., 5th Lnrs.), March 6th; Lt. A. P. G. Vivian (Lt., R. Fus.), May 31st.

Transferred to unempld. list :—Lt. G. W. Cox (R. Highrs., T.F.), Feb. 23rd; Lt. G. J. Ogg (H.L.I.), March 6th; Lt. (Hon. Capt.) C. F. Morris, March 13th; Lt. S. S. Vanderhook, April 14th (substituted for the "Gazette," June 10th); Lt. D. W. Marriott, Sec. Lt. A. D. E. Rippon, April 15th; Sec. Lt. R. D. Davis, April 17th; Sec. Lt. F. Brown, April 21st; Sec. Lt. W. J. Veldman, May 2nd; Sec. Lt. R. Martin, May 9th; Sec. Lt. F. D. Owen, May 12th; Sec. Lt. H. E. Ray, May 15th; Sec. Lt. G. L. Ross, Capt. N. C. F. Francis, May 16th; Lt. H. F. Cochran Lt. A. E. Kennedy, Sec. Lt. O. Thamer, May 20th; Lt. J. H. Catleugh, M.B.E., Sec. Lt. E. W. Jackson, May 21st; Lt. G. J. M. Peel, May 22nd; Lt. A. E. Stubbs (Lond. R., T.F.), May 24th; Capt. R. S. C. De Chaffey, May 25th; Sec. Lt. E. L. Girling, May 27th; Lt. E. R. Yates, Lt. G. G. Yeandle, May 28th; Sec. Lt. C. R. Martin, May 31st; Lt. A. Appleby, Sec. Lt. F. J. Pegg, June 1st; Capt. H. F. Mercer, June 2nd; Lt. K. A. Meek, June 3rd; Sec. Lt. A. K. McD Brown, Sec. Lt. C. H. Place, June 5th; Lt. O. G. Thomas, June 9th; Sec. Lt. J. V. Flanaghan, June 10th.

Lt. J. K. Line relinquishes his commn. on account of ill-health, and is permitted to retain his rank, June 6th.

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Lt. G. F. Bishop (Lond. R., T.F.) is dismissed the Service by sentence of a General Court Martial, March 10th.

The notification in "Gazette," Nov. 18th, 1918, concerning J. Inglis (temp. Capt., R. Highrs.) is cancelled.

The notification in "Gazette," March 7th, concerning Lt. F. Crossley is cancelled.

The notification in "Gazette," May 2nd, concerning Sec. Lt. T. A. Chilcott is cancelled.

The notification in "Gazette," June 10th, concerning Sec. Lt. (Hon. Lt.) A. V. Collins is cancelled.

TECHNICAL BRANCH.—R. E. Threlfall (Lt., R.E.) is granted a temp. commn. as Lt., Grade (A), Sept. 14th, 1918 (subs'tuted for notification in "Gazette," Dec. 6th, 1918).

Sec. Lt. W. S. C. Stephens to be Lt., April 2nd, 1918.

Sec. Lts. to be Lts. without pay and allowances of that rank:—A. V. Sutton, April 2nd, 1918; G. F. Kite, Dec. 29th, 1918; R. E. Hussey, Feb. 5th.

The following Cadets are granted temp. commns. as Sec. Lts., Grade (B):—1543 G. H. Taylor, 403893 W. J. Cole, 74897 A. Gold, 403502 S. Wells, Nov. 12th, 1918.

Transferred to unemplid. list:—Sec. Lt. C. MacPherson, Feb. 20th; Sec. Lt. C. H. Chadwick, March 29th; Lt. N. J. Scline (Monmouth R., T.F.), April 9th; Lt. C. E. Mayron, April 10th; Sec. Lt. (Hon. Lt.) H. K. Knight, April 16th; Sec. Lt. I. E. Parry, April 19th; Lt. H. P. Jenkinson, Sec. Lt. A. H. Knight, May 1st; Capt. A. D. S. Rice, May 13th; Sec. Lt. H. P. Rashleigh (Lond. R.), Capt. L. C. T. Sedgewick, Sec. Lt. L. J. Slack, May 14th; Lt. C. M. Allare, May 15th; Lt. F. C. Sternfeld-Bennett, May 19th; Lt. J. B. Saer, May 20th, Sec. Lt. J. Kollo, May 21st; Lt. F. C. Laxton, May 23rd; Lt. W. G. Duffield, Sec. Lt. (Hon. Lt.) E. G. A. Jones, M.C., Capt. J. A. Payne, May 28th; Lt. R. A. Fearnley, May 30th; Lt. G. M. E. Bayly, Sec. Lt. W. A. Dowling, Capt. P. P. Eckersley, Sec. Lt. E. T. W. Nockold, May 31st; Lt. A. W. Dow, June 1st; Sec. Lt. R. M. D. Anderson, June 3rd; Capt. E. F. B. Curtiss, June 5th; Sec. Lt. M. W. Tomlinson, June 13th.

The following Lts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—J. F. Guinan, June 6th; W. Gregory (caused by wounds), June 11th.

The notification in "Gazette," March 11th, concerning Sec. Lt. C. MacPherson is cancelled.

CHAPLAINS BRANCH.—Capt. C. E. Kindersley is transferred to unemplid. list, April 23rd.

The Rev. F. H. Wheeler, D.S.O., temp. Chaplain to the Forces, 2nd Class (R.A.C.D. (United Board), is granted a temp. commn. as Chaplain, with relative rank of Capt., and is granted the relative rank of Maj. while empld. as Asst. Principal Chaplain (United Board), April 17th.

Memoranda.—Sec. Lt. (Hon. Lt.) A. A. J. Poole is granted hon. rank of Capt.

H. H. Stoodley is granted a temp. hon. commn. as Lt., June 4th.

The following Overseas Cadets are granted temp. commns. as Sec. Lts.:—152676 H. F. Blandy, 187255 S. T. Cochrane, 176511 H. H. Devenish, 40397 V. Delplanche, 182158 M. E. Gay, 176805 E. H. Hodgson, 182176 C. H. M. Lowrey, 184273 E. P. Oertel, 182277 C. Ryneveld, 216232 W. A. Spurr, Feb. 15th.

The following Cadets are granted hon. commns. as Sec. Lts.:—177775 A. G. Ashbourn, Jan. 15th; 176016 F. J. Pope, Feb. 8th; 538085 E. P. Stanford, Feb. 21st; 5535 J. O. Morrison, March 28th; 44221 W. Garner, April 23rd; 36579 E. Charlton, May 20th.

The following relinquish their commns. on ceasing to be empld.:—Temp. Hon. Lt. D. W. Ditchburn, Feb. 5th; Temp. Hon. Lt. W. J. Parkinson, Feb. 23rd; Temp. Hon. Lt. E. Quixley, Temp. Hon. Lt. W. Sutton, Temp. Hon. Lt. G. H. Tattersall, March 16th; Temp. Hon. Lt. G. P. Muirhead, April 16th; Temp. Hon. Lt. M. C. Boff, Temp. Hon. Lt. R. J. Grant, Temp. Hon. Lt. J. B. Gre-y, Temp. Hon. Lt. R. B. Verney, Temp. Hon. Lt. M. R. Whitham, May 16th; Temp. Hon. Lt. H. L. Luckling, Temp. Hon. Lt. J. A. Turner, May 31st; Temp. Hon. Capt. T. Greening, June 15th; Temp. Hon. Lt. F. C. I. Brendel, Temp. Hon. Lt. C. H. Piroth, Temp. Hon. Lt. A. J. Simpson, June 16th.

Transferred to unemplid. list:—Lt. D. C. Sutherland, from (S.O.), May 17th; Sec. Lt. (Hon. Capt.) H. F. L. Dixon, from (S.O.), May 31st; Capt. P. A. Moodie, from (S.O.), June 7th.

The notifications in "Gazette," May 9th, concerning the following officers are cancelled:—Lt.-Col. F. H. Playfair, Lt.-Col. A. W. C. McFall, Maj. W. P. Alexander, Maj. D. Mackenzie.

FROM THE COURT CIRCULAR.

MARLBOROUGH HOUSE, June 20th.

Queen Alexandra received Captain J. W. Alcock and Lieutenant A. Whitten Brown to-day.

WINDSOR CASTLE, June 21st.

Captain John Alcock and Lieutenant Arthur Whitten Brown had the honour of being received by the King to-day, when His Majesty conferred upon them the honour of Knighthood and invested them with the Insignia of Knights Commanders of the Most Excellent Order of the British Empire (Civil Division).

ADMIRALTY APPOINTMENTS.

The following appointments are made:—

JUNE 21st.—Comdr.—R. L. Jermain, to "Furious," June 21st.

Ch. Gunners (T.).—A. L. Honeysett, to "Furious," June 19th.

Commd. Shipwt. (late Capt., R.A.F.).—J. W. J. Cheyney, to rank of Shipwt. Lieut., senv., Oct. 24th, 1918.

PERSONAL NOTICES.

NAVAL.

MARRIAGE.

FORBES-BENTLEY—BRISTOW.—On June 7th, 1919, at the parish church of St. Bartholomew the Great, Smithfield, E.C., Capt. Rupert Forbes-Bentley, D.S.C., R.A.F., of Massands, Beckley, Sussex, was married to Ruth Harriett, elder daughter of Charles Bristow, Bank House, King's Lynn, by the Rev. Tilden Smith.

MILITARY.

DEATH.

FENN.—Capt. Roland Pitt Fenn, Croix de Guerre, R.F.C., 18th Squadron (formerly S.Q.M.S., Surrey Yeomanry), who was reported missing on March 25th, 1918, is now officially presumed killed on that date. He was the only son of the late William George Fenn, of Croydon, and Mrs. Fenn, Warlingham.

ENGAGEMENT.

WHISTLER—GOTTIGNIES.—An engagement is announced between Capt. Harold Alfred Whistler, D.S.O., D.F.C., Dorsetshire Regt., attd. R.A.F., second son of the Rev. A. J. Whistler and Mrs. Whistler, of Warkton Rectory, Kettering, and Hélène Marguerite, second daughter of M. J. Gottignies and Mme. Gottignies, of Marchienne-au-Pont, Belgium.

MARRIAGES.

DUFFUS—GILES.—On June 21st, at St. Agnes Church, Newmarket, Major Chester Stairs Duffus, O.B.E., M.C., R.A.F., only son of Mr. and Mr. Stairs Duffus, of Blackheath, was married to Evelyn Ursula, only daughter of Major G. D. Giles, O.B.E., R.F.A. (T.), and Mrs. Giles, of Douglas Lodge, Newmarket, by the Rev. Colville Wallis, assisted by the Rev. Ernest Powles.

HOLDER—HART.—On June 18th, at the Cathedral Church, Chelmsford, Capt. Frank Douglas Holder, M.C., the Buffs and R.A.F., younger son of Mr. and Mrs. E. Holder, of Purley, Surrey, was married to Cynthia Olive, only daughter of Mr. George W. P. Hart, of Chelmsford, by the Rev. F. S. Paynter, Rector of Springfield.

MASSY—SMITH.—On June 3rd, at Murree, India, Capt. Derek Fitzgerald Massy, 33rd Ind. Cav. and R.A.F., fourth son of the late Major Hugh Ingoldsby Massy and Mrs. Massy, of Stoneville and Cloughnarold, Co. Limerick, Ireland, was married to Margaret Vina Smith, daughter of the late Mrs. Anne Smith, of Hampstead and Bradford.

SORMANI—MORTON.—The marriage is announced as having taken place between Mr. Paul Sormani, West Yorkshire Regt. and R.A.F., only son of the late Henry Sormani and Mrs. Sormani, Charlwood, Sutton, and Dolores, widow of Mr. Rex Morton, London Regt., Pinehurst, Oxted, only daughter of Major and Mrs. Fegen, 38, Ashley Gardens, S.W.

BIRTHS.

BAKER.—On June 11th, at Dieppe, to Renée, the wife of Capt. Lovell D. Baker, late R.F.C.—a daughter.

CORBY.—On June 21st, at Thurlow Park Nursing Home, West Dulwich, the wife of Capt. H. G. Corby, R.M.F., attd. R.A.F., of a son.

AIR FORCE.

ENGAGEMENT.

CATTERSON SMITH—RYLAND.—The engagement is announced of Capt. R. M. Catterson Smith (late R.A.F.), younger son of Mr. and Mrs. Catterson Smith, of Edgbaston, and Caroline Mabel, eldest daughter of the late Mr. and Mrs. Ryland, of Baskerville House, Harborne, Birmingham.

MARRIAGES.

ABELL—ATKIN.—On June 9th, at All Saints Church, Bulkeley, Egypt, Lieut. F. H. Abell, R.A.F., son of the late F. H. Abell, of Cape Town, was married to Gertrude I., daughter of John T. Atkin, of Bulkeley, Egypt, by the Rev. L. Fry.

GARNETT—DAWKINS.—On June 18th, at St. James' Church, Emsworth, Major Hugh Garnett, R.A.F., was married to Enid, widow of C. J. R. Dawkins, 9th Welch, by the Rev. Wilson Pearce, Vicar of Newtown.

KANN—LOVE.—On June 19th, 1919, at St. Saviour's Church, Hampstead, Capt. Raymond Victor Kann, R.A.F., was married to Dorothy, youngest daughter of Mr. and Mrs. P. Love, of 96, Adelaide Road, Hampstead.

KEMP—BENSON.—On June 21st, at Christ Church, Lancaster Gate, Capt. Alan Frederic Kemp, late R.A.F., of 80, Oxford Gardens, W., was married to Madeleine Benson, widow of Lieut. R. C. Benson, R.F.C., and elder daughter of Mr. and Mrs. Geo. Ashby, of The Lodge, Harmondsworth, Middlesex.

BIRTH.

ANGELL.—On June 19th, 1919, at 32, Meadway, Gidea Park, Essex, the wife of Capt. Bruce O. Angell, M.B.E., late R.A.F.—a son.

MAYNE.—On June 18th, at 34, Cathart Road, S.W.10, the wife of Lieut. Blair Otway Mayne, R.A.F., of a son.

SANSOM.—On June 10th, 1919, at 2, The Green, Richmond, the wife of Lieut. W. E. Sansom, A.F.C., R.A.F., of a daughter.

* * *

On June 18th Lieut. C. L. Startup and Air Mechanic Carpenter were flying an Avro biplane at the Northolt Aerodrome, when a seam of the petrol tank burst and the petrol caught fire. The machine was 1,000 ft. up when the fire occurred. Both pilot and passenger climbed out onto the wings, and the pilot contrived to land the machine. Both men are now in hospital, and, it is reported, progressing favourably.

THE NAVY'S AIRSHIP.

The Naval airship, R.29, built by Sir W. C. Armstrong-Whitworth, Ltd., at Selby, which accompanied R.34 on her trials, was, it is stated, the only rigid airship used on active service. On one occasion she engaged with four enemy submarines and succeeded in sinking one of them.

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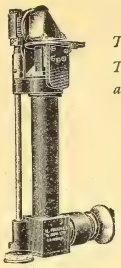
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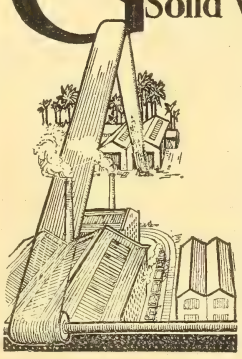
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R.A.F. INVESTITURES.

His Majesty the King will confer the Insignia of the Distinguished Flying Cross and the Air Force Cross on a limited number of officers to whom they have been awarded, at Investitures to be held at Buckingham Palace on Saturday, July 19th and Thursday, July 24th.

Officers who desire to receive their decorations on those dates should apply immediately to the Secretary, Air Ministry, Hotel Cecil, Strand, W.C.2., specifying their full Christian names and surnames, and whether to receive the Distinguished Flying Cross or the Air Force Cross. Arrangements will then be made at the above Investitures as far as possible, and those officers only who receive a summons for a specific date should attend.

Officers who have already applied, some time ago, should repeat their applications now.

Officers who may require tickets for their friends to witness their Investitures should apply to the Central Chancery of the Orders of Knighthood, St. James's Palace, S.W.1, after they have received notices from that Department to attend.

PENSIONS FOR R.A.F. OFFICERS.

The Air Ministry announces that demobilised officers who claim to be suffering from a disability due to, or aggravated by, war service may, notwithstanding their original statement to the contrary on Army Form Z22, submit a claim for pension.

Claims should be forwarded to the Officers' Pension Branch, New North Street, Theobalds Road, W.C.1, in order that a Medical Board may be arranged, and should be accompanied by details of rank, medical category on joining, and last unit.

HONORARY COMMISSIONS FOR R.A.F. CADETS.

It is notified that honorary commissions will be granted to R.A.F. cadets who were under training at the date of the Armistice, and have since been demobilised or returned to the Army Such honorary commissions, however, will not be awarded to cadets whose training was discontinued on account of unfitness.

A FLIGHT OVER GERMANY.

The British naval airship R34 left the aerodrome at East Fortune at six o'clock on June 17th, and proceeded eastwards over North Berwick, and thence across the North Sea and past the Island of Helgoland. She then skirted the German coast and passed over Wilhelmshaven, Cuxhaven, the Kiel Canal, and Hamburg. The airship then cruised over the southern Baltic.

While she was crossing the Danish coast an aeroplane ascended from Copenhagen and signalled greetings to the British airship. A low altitude was kept as she sailed over the German north-western territory, and the vessel must have been plainly visible to the Germans.

The airship confined her cruise to the German coast-line and coast towns, and did not visit Berlin.

During the whole of the flight R34 was in wireless communication with home, and her long-range apparatus, which had a thorough test, gave the most satisfactory results. In fact, the whole mechanism of the airship, which had a severe trial, especially during the homeward journey, worked magnificently.

The staying power of the vessel was all the more remarkably demonstrated by the fact that during her homeward journey she had a very strong westerly wind for twenty hours against her.

In the opinion of the crew the results of this trial show that the Atlantic flight could be easily accomplished by R34.

The airship was rapidly placed on a war footing before she was ordered to the German coast, and while no bombs were carried, Lewis and Vickers guns were mounted on the cars and on the roof of the ship.

R34 landed at East Fortune early in the morning of June 20th, having covered a distance of 2,000 miles.

AVIATION IN AFGHANISTAN.

Concerning the part played by aircraft in the relief of Fort Thal, Afghanistan, the "Times" correspondent writes on June 5th of a race that took place between an aeroplane and an armoured car to decide which should enter Thal first. He says:—

"It seemed to be a dead-heat, and while the contestants were arguing the point the enemy dropped a shell between them, which ended the dispute. The car hurried off and the aeroplane ascended to search for the gunners."

A CHINESE VISITOR.

Rear-Admiral Woo, of the Chinese Navy, on June 18th, visited the French submarine station and aviation centre at Toulon. He then left for Marseilles, en route for China.

FLYING TO SPAIN.

On June 21st an aeroplane built by the Italian armament firm of G. and O. Ansaldo and Company for the Spanish Government arrived in Madrid, having flown from Barcelona over Tarragona to the capital in 3 hours 15 minutes. The pilot was Lieut. Grasse.



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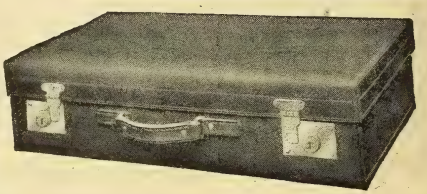
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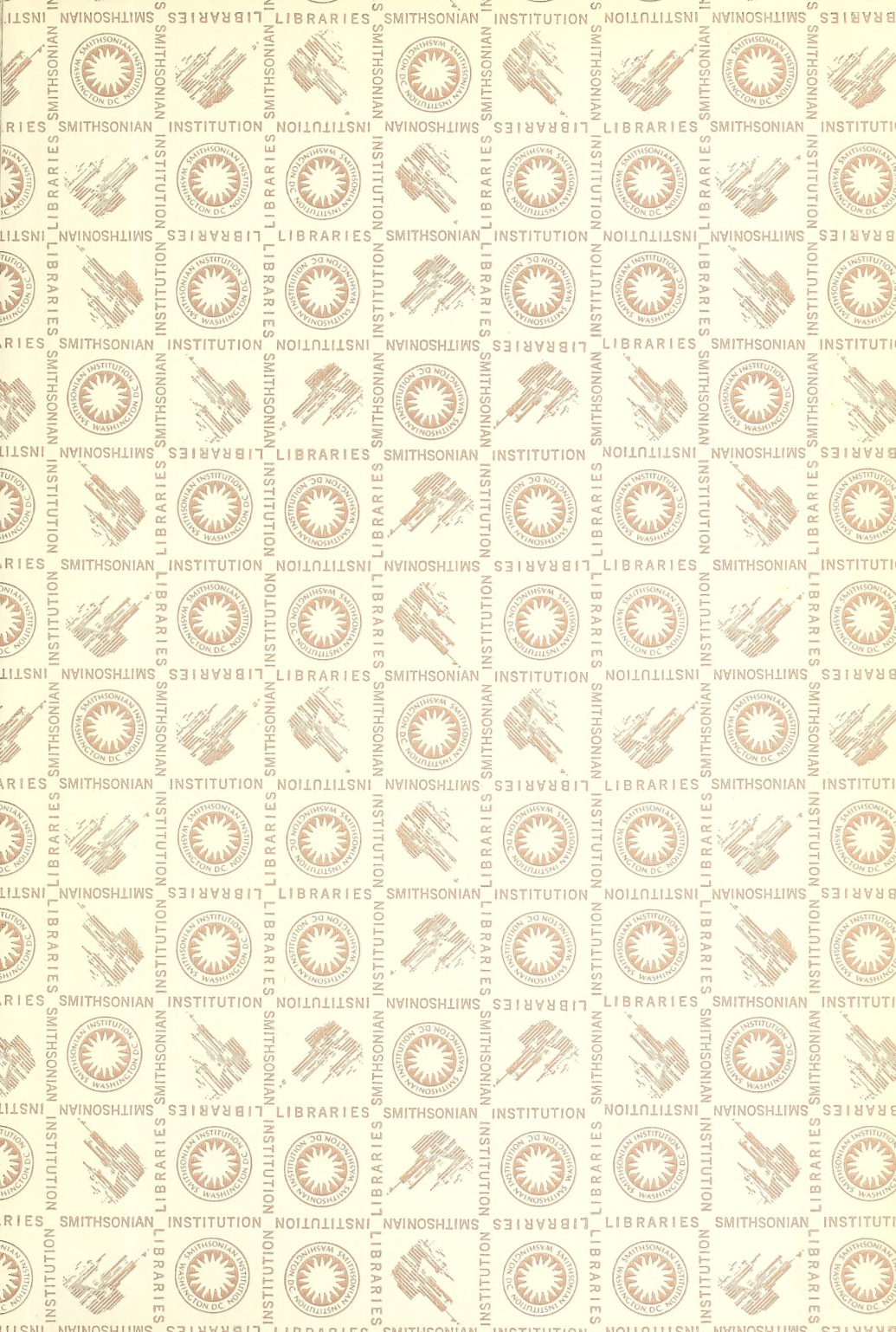
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